Q. Please provide a copy of Hydro's Work Execution Implementation Process Manuel.

A. Please refer to PUB-NLH-035, Attachment 1 for Newfoundland and Labrador Hydro's Work Execution Implementation Process Manuel.

Newfoundland & Labrador Hydro
Group of Companies

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HYDRO
THE POWER OF COMMITMENT

CHURCHILL FALLS
(LABRADOR) CORPORATION LIMITED
A HYDRO GROUP COMPANY

WORK EXECUTION

Overview

What is it and why is it an important part of Work Management?

People Powered Performance

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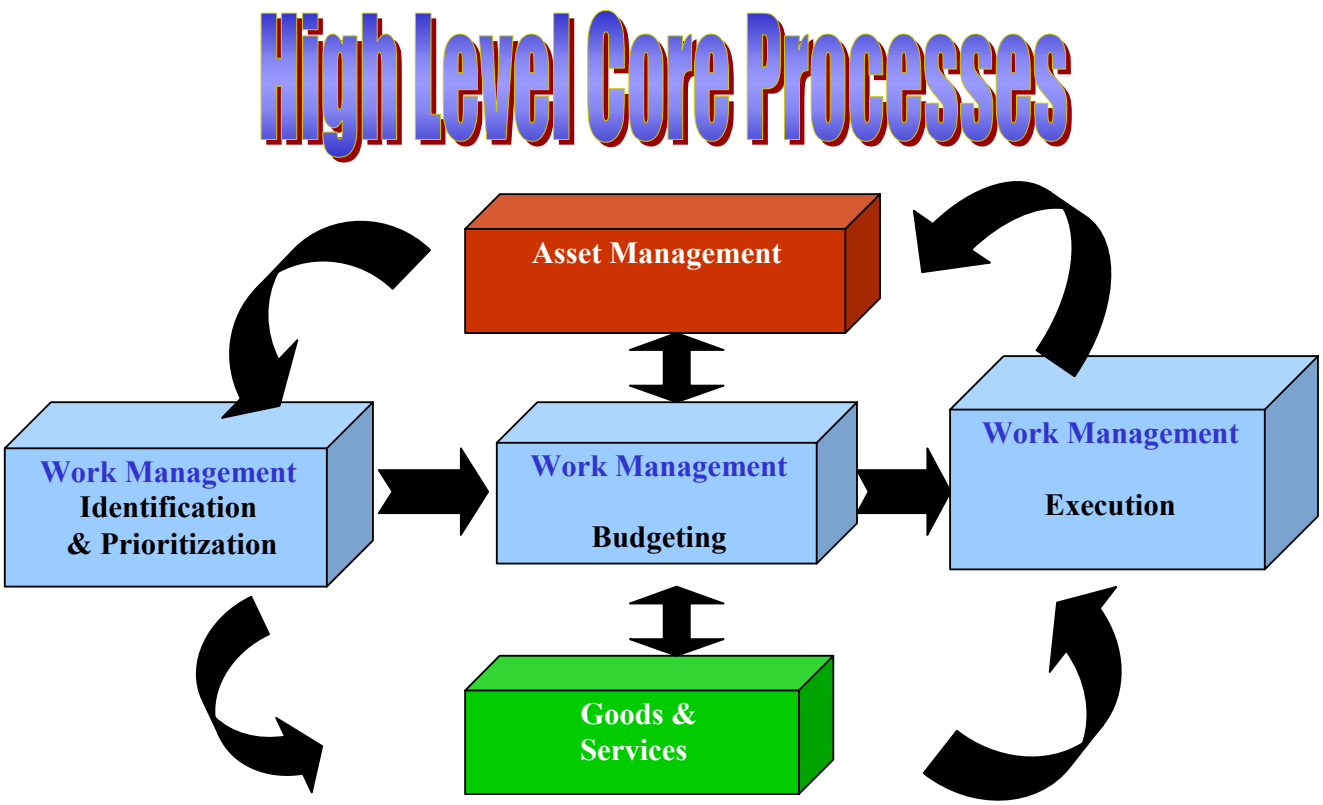
Work Management

Work execution is one of three components making up the work management process. A work management process is a method by which work is identified, selected, prioritized, budgeted, planned, coordinated, scheduled and executed.

The Hydro Group of Companies has further defined the Work Management process into the following:

1. Work Identification and Prioritization (WI&P) Process
2. Work Budgets Process
3. Work Execution Process

Figure 1: High Level Core Processes



Work Identification and Prioritization (WI&P) Process

The purpose of this part of the Work Management Process is to identify, evaluate and prioritize work to ensure that the work funded by the Hydro Group of Companies is aligned with the corporate strategic plan and matched to available financial resources. More specifically the process will take incoming proposals, needs and requirements, screen them based on high level strategic/business value, develop work estimates/projections (i.e., material, labour, costs, and person-hours, etc.) and deliver all future approved work requirements into the Work Budgets process. Projects and initiatives will be ranked and prioritized at a departmental level and eventually, at a cross-divisional level. This corporate prioritized work listing will be balanced to match financial resources and then delivered to the work budgets process for development of future plans.

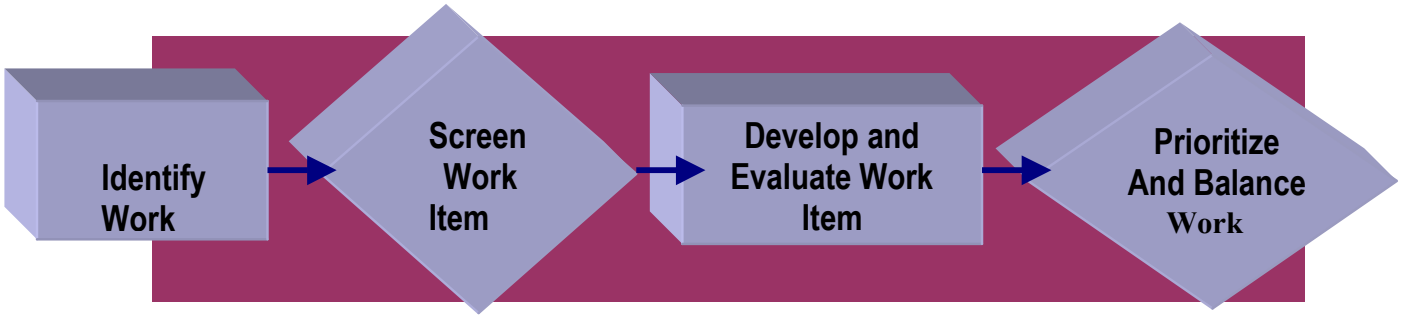


Figure 2: WI&P Process Overview

Work Budgets Process

The purpose of this part of the Work Management process is to provide all parties within the Hydro Group with the information to properly schedule and budget work efforts. Through the consolidation of information from many sources, this process will provide the following deliverables:

1. Master Work Plan and Schedule
2. Master Resource Plan and Budget
3. Master Procurement Plan and Budget
4. Financial Budget
5. Communications Plan

The Work Budgets process will gather and consolidate information used in the Master Work Schedule, Resource Schedule, Procurement Plan and Financial Budget. The information will be reviewed identifying and communicating all instances when demand exceeds available resources. The process will facilitate negotiation of any identified conflicts. Changes and updates resulting from the negotiation will be incorporated into the appropriate schedules and plans. An internal review of the proposed schedules and budgets will be performed offering a last point of resolution for any outstanding conflicts. Final external review and approval of the financial budgets will trigger the communication of approval for all schedules and budgets to the Work Execution process.

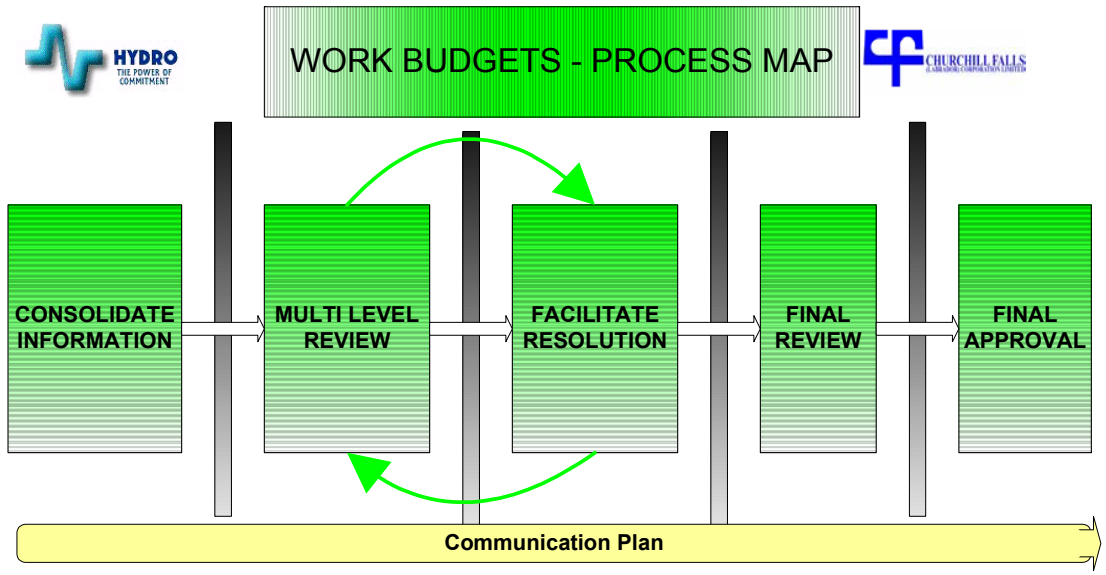


Figure 3: Work Budgets Process Overview

Work Execution Process

1. PURPOSE:

The purpose of this part of the Work Management process is to provide an effective and efficient means to properly manage the execution of work; more specifically the five work plan types approved in the work budget process. This process is designed primarily to handle work of which there is sufficient time to plan and schedule. However, there are provisions to handle emergency and urgent work as well. The process was designed realizing that it's not logical or economical to plan all work to the same degree and as a result the process contains guidelines to help determine the degree of planning work should receive. The process is intended to provide a means through which quality work can be performed on schedule at least cost.

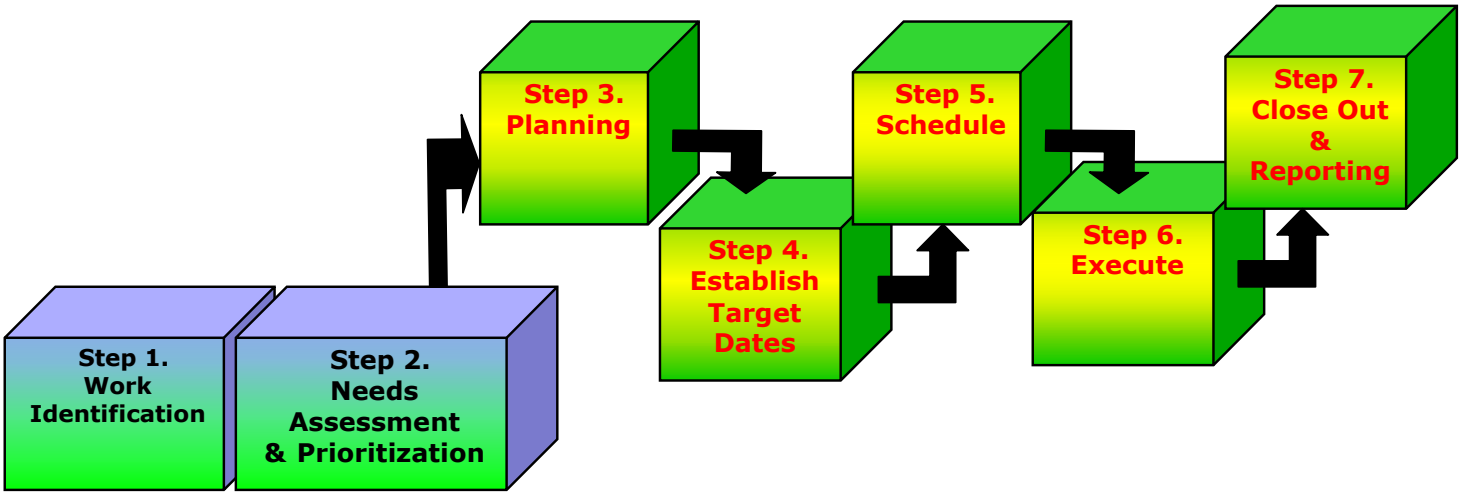


Figure 4: Work Execution Process Overview

2. OBJECTIVES:

One of the strategic goals of The Newfoundland and Labrador Hydro Group of Companies is to "Optimize the Performance of our Employees". The primary objective of the Work Execution Process is to increase employee productive time by reducing waste time thereby making the most efficient use of resources in the execution of work. To meet this objective the company had to:

1. ***Define and map an effective and efficient Work Execution Process.***
2. ***Define and communicate the roles of all process participants.***
3. ***Identify/establish lines of communication within the process.***
4. ***Provide adequate measures to monitor progress and promote accountability.***
5. ***Establish and communicate work priority definitions.***
6. ***Establish means for storing standard job plans for repetitive jobs.***
7. ***Identify and provide tools to support the process.***
8. ***Provide necessary process training.***

Some of these objectives were determined from a root cause analysis of the issues and concerns documented as a result of surveys, questionnaires and interviews done across the Hydro Group of Companies. Other objectives were a result of interviews and visits to other companies to see what they do. The lessons learned both internally and externally were incorporated in the objectives.

3. BENEFITS:

1. ***Increased productive time by reducing delays.***
2. ***Improved utilization of human and physical resources.***
3. ***Formal documented Work Execution Process for the Hydro Group of Companies.***
4. ***Clear definition of Roles and Responsibilities for participants.***
5. ***Improved lines of communication between stakeholders.***
6. ***Metrics to allow performance measurement.***
7. ***Ownership of outages to provide better utilization.***
8. ***Improved management of work through a consistent approach to work prioritization.***

4. PROCESS OVERVIEW (BASIC CONCEPTS):

The Newfoundland and Labrador Hydro Group of Companies performs work that generally involves either routine or project work. Routine work is ongoing and to some degree repetitive and is work normally done to sustain the business. Routine work consists of corrective, preventive, non-maintenance and some small capital work such as service extensions and distribution system upgrades. Project work is normally a means to respond to those requests that cannot be addressed within the organization's normal operational limits. Project work is work performed on assets on a one time or infrequent nature. Projects will be categorized as either capital or operating. Separate process flow charts have been developed for both routine and project work.

The redesigned process involves a seven-step process from the time work is identified until close out and reporting:

1. Work Identification
2. Needs Assessment and Prioritization

(WIP) Guidelines

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3. Planning
4. Establishing/Confirming Target Dates
5. Scheduling
6. Executing the Work.
7. Closeout and Reporting

(WE) Process

Work Identification

- Any employee or stakeholder can identify work**.**

Needs Assessment and Prioritization

- All work has to be assessed to see if its meets value added criteria and needs assessment criteria as defined in Work Identification and Prioritization Process.

- Work that passes through the WI&P Criteria has to be prioritized. The priority definitions for routine work were developed as part of the Work Identification & Prioritization Process and will be used as guides to Work Execution. Project work will be assigned relative priorities ranked in order of most too least important.

Planning

- Work order planning is a major strategy to improve maintenance efficiency with regard to unproductive maintenance time. Planning guidelines and considerations have been developed as part of this process. Planning involves many considerations such as clarifying /developing scope, estimating labor by craft, identifying parts and material, developing schedules, identifying/arranging outages, etc.

Establishing/Confirming Target Dates

- When the work order plan is complete and final approval given, it's ready to be acted on. Based on priority, delivery of parts and services, manpower availability, outage availability, etc., target dates are established. Again, valuable time should not be spent determining target dates for low priority work. Parts, services, etc. are arranged based on target date. When all conditions have been established, the work order is moved to waiting to be scheduled backlog (status 44).

Scheduling

- Scheduling is the step in the process where the planner moves work to a weekly schedule based on priority, craft hours available, target start dates, outage availability, etc. The degree of compliance with the weekly schedule is a primary measure of how well the process is working. Plan your work and work your plan.

Execute the Work

- At this stage the supervisor assigns individual work orders to the employees for execution. Employees are expected to follow the plan and supervisor is expected to monitor progress to complete work on schedule, on budget. Any deficiencies or problems encountered with the plan after the work has started are to be handled by the supervisor or the trade's people. Emergency type work is also handled by supervisor and trades people in the same manner.

Close Out and Reporting

- When the work is complete, all applicable reporting must be done. Close out normally involves describing the actual work performed, retiring/ disposing/adding new assets, reviewing/ modifying/saving work plans, providing feedback to planners, reviewing schedule, budget and quality performance and doing a post implementation review.

5. SCOPE:

a) ***Begins With: Begins with approved work budgets including Master Work Plan and Schedule, Master Resource Plan and Budget, Master Procurement Plan and Budget, Communications Plan and Corporate Budget.***

b) Includes: Identification, Needs Assessment & Prioritization, Planning, Establishing Target Dates, Scheduling, Execution, Closing Out & Reporting of Work of the five work plan types.

Also includes specifications/justification of any required software, tools, or other enablers to support the process.

c) Excludes: Development and acquisition of technology enablers and activities falling within the Asset Management Process, Goods & Services Process, Work Identification & Prioritization Process and Work Budgets Process.

d) Ends With: Completion of quality work on time at least cost.

6. CRITICAL SUCCESS FACTORS:

1. Executive Management Commitment/Involvement through re-enforcement, support and process improvement targets.

2. Departmental Ownership and Commitment from all process participants. Take it, use it and improve it.

3. Initial and follow-up training/communication of process to all participants.

4. Promotion of a proactive maintenance environment versus a reactive maintenance environment.

5. Adherence to priority definitions. Ensure that when we are doing reactive work that it is “Real” Emergency Work. Remember unplanned work activities cost three times as much as planned.

6. Development and communication of Roles of all participants.

7. Continuous Improvement of Process.

8. Measures to monitor progress, promote accountability, and chart improvement.

7. INTERFACES & DEPENDENCIES ON OTHER PROCESSES:

Work Identification and Prioritization

The day-to-day execution of work can lead to the identification of other work items for future project work or work plan initiatives. Project work or initiatives for consideration in future work plans and identified within the Work Execution Process will be input to the WI&P process. New project work to be fast tracked for execution in the current year or current year project work that requires major changes will be routed through WI&P processes and later through work budgets to determine impact.

The Work Execution process will utilize the same evaluation criteria used to determine need and work priorities as outlined in the WI&P process. The WI&P Process Improvement Team has developed guidelines for use with the routine workflow.

Work Budgets

The Work Budget Process provides a masterwork plan and schedule, master resource plan and budget, master procurement plan and budget, financial budget and communication plan as inputs to Work Execution Process.

New project work to be fast tracked for execution in the current year or current year project work that requires major changes will be routed through WI& P processes and later through work budgets to determine impact.

Goods and Services

The day-to-day execution of work will require interaction with other processes. The most obvious of these is the goods and services process. The availability of materials and services to do work is just as important as the availability of labour. Through good planning we will identify our material requirements in advance allowing enough lead time for the delivery of materials and services before work is scheduled to start. In order to be successful the goods and services process must provide a means to communicate the availability of materials and lead times required for inventory items not in stock. Long-term work plans will allow for long term material plans, less stock outs and fewer scheduling delays due to material shortages. Work Execution will provide Materials Management with realistic advanced target start dates to ensure timely delivery of Goods and Services. Goods and Services will provide Work Execution with follow up information on material delivery dates. In urgent and emergency situations the Goods and Services Process will allow for immediate materials procurement.

Asset Management

The execution of work especially capital projects will result in the addition of new equipment and the retirement or relocation of others. The asset record management process provides for adding, disposing, retiring, transferring or refurbishing an asset. The work execution process has provided inputs necessary in keeping the asset records updated.

Proper coding and reporting to work orders is also required to ensure the correct maintenance costs are recorded to the asset record.

Contract Management

The execution of work especially with regard to projects will sometimes require the management of contacts. Utilization of the contract management process to manage work by outside sources is not within the scope of work execution but is required in the overall work management process.

8. AN IMPORTANT PART OF WORK MANAGEMENT

From this overview of the work execution process you should have learned the answers to the following questions. Define The Work Execution Process? What is included in the scope of the Work Execution Process? What part does The Work Execution Process have in the Work Management Process?

What is The Work Execution Process? What is included in the scope of The Work Execution Process?

A process used to safely complete quality work on schedule at least cost. The process includes seven (7) steps:

1. **Work Identification**
   Requested work activities and equipment deficiencies are clearly described so the scope, significance, and need can be evaluated.

2. **Needs Assessment and prioritization**
   Work requests are screened and approved based on value to the company.

3. **Planning** Determine the best way to minimize wasted time during jobs by ensuring all required resources including materials, tools, and labour are identified.

4. **Establishing Target Dates**
   Realistic target dates are established with consideration given to the master work plan schedule, resource availability, coordination among participating departments, impact on equipment and/or system security, impact on operations, impact on customers, etc.

5. **Scheduling**
   Develop a weekly schedule that attempts to assign work from a planned backlog for every available craft hour based on a forecast of required hours with a goal to minimize wasted time between jobs.

6. **Execute The Work**
   Work is implemented and controlled in accordance with the plan, the schedule, the safety and health program and the environment program. The supervisor handles the current day's work and problems.

7. Closeout and Reporting

Close out normally involves describing the actual work performed, retiring/disposing/adding new assets, reviewing/ modifying/saving work plans, providing feedback to planners, reviewing schedule, budget and quality performance and doing a post implementation review.

What part does The Work Execution Process play in the Work Management Process?

The maximum value of the Work Execution process will be realized when the two front end parts of the Work Management process, WI&P and Work Budgets, successfully deliver approved budgets, master schedule, and resource plan for the five work plan types, 8 to 9 months in advance of the year of execution. This will allow the planning and scheduling components of the work execution process to become more effective. Effective planning and scheduling will reduce and in many cases eliminate many of the typical work interruptions, consequently being a factor in the performance of quality work completed on time at least cost.

Plan the work and work the plan. Weekly schedule compliance will ultimately be an indicator of how well we have done with working the plan. Although the work execution process has provisions for reactive jobs, it will be of little value to a business that is content to be in a reactive mode. The Hydro Group of companies strives to be a proactive company and thus should reap the benefits of the work execution process. Industry averages indicate that reactive maintenance activities cost three times as much as jobs that are planned and scheduled. The amount of work accomplished will rise as delays are reduced.

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Routine Work Process Flow Chart

Process Flow Major Activities

Work Identification		
No.	**Name**	**Description**
1	Work Identified	Work can be identified by any Hydro Group employee or stakeholder. An employee has several options for requesting work. • Input request electronically to JD Edwards • Submit a written work request • E-mail • Phone • Verbal External stakeholders normally make their requests through: • E-mail • Phone All work requests, regardless of communication media, will be input to JD Edwards Maintenance Module for processing as per steps outlined in process flow chart.

Needs Assessment & Prioritization		
No.	**Name**	**Description**
2	Assess Urgency	Needs assessment and prioritization of all work requests is normally the responsibility of the Asset/ Business Unit Manager. On-call or Shift Supervisors are required to assess and prioritize work requests when required. In any event, the individual responsible for prioritizing work is expected to consult with other knowledgeable employees, when required, to determine the correct prioritization (i.e. ECC, Operations, other Supervisors, etc.). Routine work, regardless of its nature, will be given a priority rating of 1 to 4 using the corporate Routine Work Prioritization Guide for evaluating and prioritizing identified day-to-day work. The intent of the

Needs Assessment & Prioritization		
No.	**Name**	**Description**
		prioritization guide is to provide an objective consistent approach to prioritizing work; it is not meant to replace good judgment or discussion of importance of work between supervisors. There may be cases where this guide is not suited. A combination of evaluation factors to produce an overall level of importance, combined with urgency, will help determine the priority of a planned piece of work. A priority calculator provided with user selectable fields will automatically calculate priority. Refer to Appendix F for details of Routine Work Prioritization Guide.
3	Initiate Work Requests for Priority 1 (Emergency Work) As Soon As Practical	When a work request has been assessed and assigned priority 1 (emergency work), it must be acted on immediately. Work of this nature normally begins with verbal authorization and prior to any formal work request being input to JDEdwards Maintenance Module. It's the responsibility of the Supervisor or designate to initiate a formal work request as soon as practical after the event has occurred. The request is required to capture cost and maintenance history against the asset, to procure parts and to serve as a record for analysis and evaluation of emergency work. Priority 1 (emergency work) is reactive work and ultimately will be measured to determine the quantity of this type of work. Excessive quantities of Priority 1 work will be analyzed to determine root causes with the intent to reduce to acceptable levels. Acceptable industry standards for reactive work is 10% or less of total hours consumed doing work. Local Management will be responsible to set targets in their area of responsibility.
4	Initiate Work Request for Priority 2 (Urgent Work)	When a work request has been assessed and assigned Priority 2 (Urgent Work), action must be taken within a seven (7) day period as outlined in the Routine Work Prioritization Guide. In cases where a formal work request has not been initiated, it will be the responsibility of the supervisor or designate to ensure a work request is generated. Although Priority 2 work is

Needs Assessment & Prioritization		
No.	**Name**	**Description**
		considered reactive, there is normally sufficient time to do fast track planning. Priority 2 (Urgent Work) is reactive work and ultimately will be measured to determine the amount of this type of work. Excessive quantities of Priority 2 work will also be analyzed to determine root causes with the intent to reduce to acceptable levels. Acceptable industry standard for reactive work is 10% or less of total hours consumed doing work. Local Management will be responsible to set targets in their area of responsibility.
5	Initiate Work Request for Priority 3 & Priority 4 Work	Work requests for Priority 3 and 4 work orders are submitted by any employee or stakeholder for entry at status 01 (awaiting work order review) to JDE Work Order Module. Priority 3 and 4 work is proactive and in this type of work this process is specifically designed to handle. This work is considered proactive because there is sufficient time to do the needs assessment and prioritization, to plan, to establish target dates and to schedule. Metrics are developed to measure the amount of time consumed doing proactive work. Local management will be responsible to set the targets in their area of responsibility. Acceptable Industry standard is to spend 80%+ time on proactive work.
6	Review Request for Acceptance	The individual responsible to review work requests for acceptance is the Asset or Business Unit Manager. • The manager will apply/approve proper priority. • Accept or reject work request and move to status 91 (reject) with reason on W/O. Communicate reason for rejection to originator.
7	Feedback Reason for Rejection to Originator/ Department	The Asset or Business Unit Manager must communicate reason for rejection to the originator or department.
8	Approval (Scope)	The individual responsible for approving scope of work is the Asset or Business Unit Manager. • The work request at this stage contains minimal information; an asset number, asset description,

Needs Assessment & Prioritization		
No.	**Name**	**Description**
		priority and a clear description of work. • Manager or designate will approve the scope of work and move to status 04(approved in scope) to proceed in the current year of execution or defer to future years status 05 (Five Year Plan). • In cases when an Asset or Business Unit Manager does not want to see the request for financial approval, an indicator will be provided on the work order for a designate to provide financial approval.
9	Submit for Consideration in Future Years (Plan Repository)	There will be cases when work is approved in scope by an Asset/Business Unit Manager or designate but the work will not be done in the present year of execution due to constraints such as financial, labour, etc. In those cases the work request will be moved to status 05 (in Five Year Plan), for the year that it is expected to be executed. If the request is considered to be an operating or capital project, it will be returned to the Work Identification and Prioritization Process for evaluation and prioritization. This is indicated as an off page connector in the Process Flow Chart.

Planning		
No.	**Name**	**Description**
10	Minimal or Extensive Planning	The individual responsible for determining whether a work request requires minimal or extensive planning is the Planning Supervisor. • Planning Supervisor assigns code to work request indicating minimal or extensive planning • If minimal planning is required, planning will be done and work order will be moved to status 44 (WO waiting to be scheduled). • If extensive planning is required, work order will be moved to status 10 (Planning Backlog). • Minimal planning is the degree of planning applied to smaller jobs of which it is not cost effective to spend much planning time on. These

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Planning		
No.	**Name**	**Description**
		jobs are normally short duration, single craft, low dollar value, of very little historical value, and while parts may be required, the parts are normally low dollar value and readily available in store or consumable bins. Examples of such work might include: • Hanging a bulletin board • Replacing a frayed electrical chord. • Tightening valve packing. Sufficient Planning for this type of work shall include: • Clear description of work • Labour estimate by craft • Parts list if required. Extensive Planning is the degree of planning applied to all other work. It might be described as larger, important, critical, and more complex pieces or work with important historical value. Extensive planning includes: • Verifying/defining scope of job • Providing labour estimates • Identifying/specifying/procuring parts • identifying/arranging special tools • Arranging outages • Developing drawings • Safety/environmental standards • Co-coordinating with other departments • Arranging transportation/accommodations • Consider customer impact/co-ordination The guidelines for minimal and extensive planning are a part of the Work Execution Process Flow and also included in the Glossary of Terms.
11	Verify/Clarify Job Scope, Identify Labour Requirements, Identify	For work requiring minimal planning, the Planner is responsible for the following: • Verify & clarify job scope/description

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Planning		
No.	**Name**	**Description**
	Parts (no ordering or reserving of parts necessary)	• Identify labour requirements by craft • Identify parts if required • Establish target date • Move work order to Status 44 (waiting to be scheduled backlog)
12	Enter into Planning Backlog	Work orders requiring Extensive Planning are moved to status 10 (Planning Backlog) with a Planner assigned. The Planning Supervisor normally assigns the Planner.
13	Extensive Planning Activity (Develop or Utilize Existing Plans)	Planners regularly review the Planning Backlog for work orders requiring extensive planning. • If the job was done before, planner will utilize the existing plans to the extent required. • A Planner may also utilize job procedures, work methods or engineering directives as part of the planning process. • The Planner will use the extensive planning guidelines in the Process Flow Chart to complete the planning. • When the plan is complete, the Planner will move it to Status 11 (awaiting Final Approval).
14	Approval (Final)	The Asset Manager/Business Unit Manager or designate is the position responsible for final approval of the work plan. The plan is considered complete at this stage and includes: • Clear scope • Labour estimates by craft • Material requirement • Tools and equipment • Procedures, drawings, etc. • Others requirements as per planning guidelines If the manager approves, the work order status will be changed to Status 14 (Final Approval for Execution).

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Planning		
No.	**Name**	**Description**
15	Submit for Consideration in Future Years, Job Plan Repository (Deferral)	The individual responsible for this activity is the Asset or Business Unit Manager. • There will be cases when work is given final approval by an Asset/BU Manager or designate but decision made not to do in the present year of execution due to constraints such as financial, labour, etc. • In those cases, the W/O's will be moved to a job repository in JD Edwards (Status 05) for expected year of completion. • If the work is considered to be an Operating or Capital Project, it will be submitted to the Work Identification and Prioritization Process for evaluation and prioritization. This is indicated as an off page connection on the Process Flow Chart.
16	Feedback Reason for Rejection to Originator/ Department	The Asset Manager, Business Unit Manager or designate must communicate reason for rejection to the originator or department and move to status 91(rejected). Enter reason on W/O

Establishing Target Dates		
No.	**Name**	**Description**
18	Consideration (Material, Delivery Dates, Tools/ Equipment Availability, Etc.)	The Planner is responsible for this activity. This is the part of the process where Planners attempt to establish realistic target dates. Considerations are: • Master Work Plan Schedule • Parts/Material delivery dates (expected) • Outage requirements • Labor and Special Tools availability • Availability of Work Details (Drawings, Procedures etc) • Season/Weather • System Security • Customer Co-ordination • Operating Cost (fuel for auxiliary) • Energy Supplier Co-ordination (NUGS)

Establishing Target Dates		
No.	**Name**	**Description**
		• Service Level Agreements • Final Engineering Design Details • Co-ordination with other Departments
19	Material Required	Planner to identify any material needed to complete the work and enter on work order. Move to status 30
19A	Obtain Goods & Services	The Work Execution Process is designed primarily to handle planned work. For planned work orders, sufficient time shall be allocated for Materials Management to obtain Goods and Services. Materials Management will use target start/ completion dates applied to the work order to deliver goods and services on time. Work orders waiting for Goods and Services are tagged with Status 30 (Waiting Materials). Materials Management procure Goods and Services and move the work order to: • Status 31 (material available locally) • Status 32 (material shipped to remote site) • Status 33 (material at remote site)
20	Outage Required	The Planner is responsible to determine if an outage is required. • If an outage is required, duration of outage and tentative date must be established. This involves communication with the Energy Control Center/Operations • Outage requirement is another important consideration when establishing target start dates.
21	Flag in Backlog and prepare outage request information	Planned work orders that require outages are stored in the backlog using a plant condition code in JD Edwards work order module (Status 35, Awaiting Plant Condition). Draft Outage request at this time. • All outages on generation, transmission and distribution equipment must have the approval of the ECC/Operations or other designated Authorities. A separate process on outage management is being prepared and is intended to be delivered with the Work Execution Process.

Establishing Target Dates		
No.	**Name**	**Description**
22	Establish Target Start & Completion Dates	Planners are responsible for establishing target start/completion dates. • When all factors that can affect target start and completion dates have been considered (i.e. parts availability, tools availability, labour availability, outage availability, etc.), the Planner will apply a realistic target start/completion date to the work order.
23	Enter into Scheduling Backlog	When all planning aspects of the work order are complete, the Planner will move the work order into the JD Edwards Backlog. • Waiting plant condition (Status 35) • Waiting to be scheduled (Status 44)

Scheduling		
No.	**Name**	**Description**
24	Develop Preliminary Weekly Schedule	Planning Supervisors and Planners in consultation with other Managers are responsible for developing Weekly Schedules. Weekly schedules are built by extracting planned work orders from the Planned Backlog (status 35- outage backlog and status 44 - planned backlog), carry over work (status 48) and standing work (status 50). The schedule will consist of a well-balanced mix of different types & priorities of work. When developing weekly schedules, Planners must consider: • Annual work plan • Outage schedule • Work order priority & start dates • Resource availability for the following week • Etc.
25	Can Schedule Considerations be Met?	This is the responsibility of the Planner. • After the preliminary weekly schedule has been built, the Planners must review individual work orders to ensure all considerations can still be met (materials, permits, resources, special tools, etc.). This is required as these work orders may have been in the planned backlog for weeks, or

Scheduling		
No.	**Name**	**Description**
		possibly months. If all considerations can still be met, the work remains on schedule.
26	Change Planned Start/ Target Completion Dates	This is the responsibility of the Planner. • If considerations can't be met, the work order is removed from the weekly schedule, new target start/complete dates applied and work order returned to the Waiting to be Scheduled Backlog (status 44) or Outage Backlog (status 35)
27	Finalize/Issue Weekly Schedule	This is the responsibility of the Planner, after sign-off by assets and labour. • When the weekly schedule is finalized, work orders are moved to Status 45 (Weekly Schedule) and issued to Frontline Supervisors and any other applicable position. • The Frontline Supervisor is responsible to become familiar with all aspects of the work and communicate schedule to department employees. • Weekly schedule compliance is the primary measure of work execution and as a result a metric has been developed to measure schedule compliance.
28	Develop Daily Schedule	Normally it is the responsibility of the Supervisor to build Daily Schedules from the Weekly Schedule but in some instances, where practical, the Planner and Frontline Supervisor will develop daily schedules together. The Frontline Supervisor has: • The authority to schedule work as required on a daily basis except in the case where work dates are fixed (i.e. outages, arrangements with other departments, etc.) • Select employees to do the work • Deal with emergency and urgent work that affect their daily schedules, i.e. determine what low priority work will be removed from the schedule to deal with schedule breakers. • Move work orders to Status 46 (Daily Schedule).

Scheduling		
No.	**Name**	**Description**
29	Obtain Goods & Services for Priority 2 – Urgent Work	Priority 2 works is considered urgent in nature and must start within seven (7) calendar days as per Routine Work Prioritization Guide. • The Planning Supervisor will initiate fast track planning (outages, parts, etc.); establish target start date in consultation with Asset/Business Unit Manager and ECC/Operations. • If Goods and Services are required, the Planning Supervisor or designate will consult with Materials Management to determine a course of action. Communication is important here as this is outside the boundaries of planned procurement.
30	Outage Required (Priority 2 – (Urgent Work)	If an outage is required, the Planning Supervisor or designate will make the necessary arrangements through ECC/Operations.
31	Co-ordinate with ECC/ Operations/Customer (Priority 2 – Urgent Work)	Although work is of an urgent nature, Planning Supervisor or designate must communicate, co-ordinate with ECC, Operations and Customers. ECC needs to be involved with respect to: • Determine realistic outage date • Customer co-ordination • Energy supplier co-ordination (NUGS) • Operating Cost (fuel for auxiliary) • System security.

Execute the Work		
No.	**Name**	**Description**
32	Communicate Weekly Schedule	Communicating the weekly schedule to the employees is the responsibility of the Frontline Supervisor. The supervisor will move the work orders to In Progress (Status 48) as required.

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Execute the Work		
No.	**Name**	**Description**
33	Execute Work	This activity is the responsibility of the Trades People and the Supervisors. • Trades people and supervisors will decide how the work will be done using their knowledge, ability and expertise, unless specific job procedures are provided. • Trades people will use any information provided by the Planner that will assist in the execution of the work. (Job Procedures, Work Methods, etc) • Supervisors will monitor all aspects of work. • Supervisors will make on site decisions for work in progress. • Supervisors will decide how to handle extra work identified during the work in progress.
34	Is Work Complete	Work is considered to be complete when all work identified on the work order has been completed as requested and meets quality standards. Work on Weekly Schedule will be evaluated by the Labour Manager/ Business Unit Manager (TRO) and Department Frontline Supervisor during the week to discuss progress. • If work is complete, capture accurate work details. • If work is not complete, monitor schedule. • If there are work orders that didn't get acted on, Labour Manager, Planning Supervisor and Asset Manger will decide if the work will go on next weeks schedule or be returned for re-scheduling or re-planning.
35	Is Work On Schedule	Planned work orders are equipped with start and completion dates and estimated labour and material requirements. During execution of work, it is standard practice to monitor the schedule. • If work is on schedule but not complete, continue with execution of work.

Execute the Work		
No.	**Name**	**Description**
36	Can Work Proceed	While work is in progress, the supervisor will monitor schedule, budget and quality of work. If for some reason the work can't proceed, the supervisor will consult with Planning Supervisor who in coordination with Asset and Labor Manager, will decide if the work order will be returned for re-planning or re-scheduling.
37	Re-Schedule	If work can't proceed for any number of reasons (break in jobs, incorrect parts, etc.), the work order will either be returned for rescheduling or re-planning. Work orders in progress that must be returned for re-scheduling or re-planning will be measured (as indicated on the Process Flow Chart). Large numbers of in progress work orders being returned for re-scheduling or re-planning may be an indicator of problems in the execution process. Work orders on a weekly schedule that do not get acted on as planned and do not go to the next week's "weekly schedule" must either be returned for rescheduling or re-planning.
38	Obtain Goods & Services for Priority 1 – Emergency Work	Priority 1 (Emergency Work) must start immediately. Essentially the supervisor and the crew do planning for this type of work as the job progresses. Planner's time on emergency work should be limited but they will assist if required. If Goods and Services are required that involve Materials Management, the Frontline Supervisor or designate will consult with Materials Management personnel to determine appropriate course of action.
39	Outage Required Priority 1 – Emergency Work	If an outage has occurred or if an outage is required for emergency work, the Asset Manager or designate will consult with ECC/ Operations.
40	Co-ordinate Outage with ECC/Operations/Customer (Emergency Outage)	If an outage has occurred or if an outage is required under emergency circumstances, Asset Manager or designate will consult with ECC/operations to determine appropriate course of action.

Closeout & Reporting		
No.	**Name**	**Description**
41	Capture Work Details	The supervisor and crew are responsible for gathering all applicable information on the completed work order. Work details must include: • Condensed/concise details of actual work performed • Feedback on work order plan • Work order completion dates • Items found during the work that require initiation of another work required. Supervisor must move work order to Status 70 (Complete waiting information to be assigned to work order). Data input person enters information and moves W/O to status 80.
42	Assets Added/Removed/ Transferred	It is the responsibility of the Frontline Supervisor /Employee, during the close out and reporting stage, to determine if assets have been added, removed or transferred, and report same on completed work order.
43	Initiate Add/Remove/ Transfer Process	If assets have been added, removed or transferred, the data entry person shall activate the Asset Management Database and enter applicable information. The Asset Manager will approve the transaction.
44	Work Plan Review Required	All completed work orders are routed back to Planning. The Planning Supervisor or designate will determine if a work plan review is required. Significant, repeatable jobs will normally be reviewed.
45	Conduct Review	The responsible Planner will review the plan, including the feedback, and make all applicable changes.
46	Save Work Plan	The revised plan will be placed in a job plan repository for future use.
47	Close Job	Work order moves to Status 90 (Work Order History) within ninety days via automatic JD Edwards procedure.

Closeout & Reporting		
No.	**Name**	**Description**
48	Produce Metrics	The metrics in the Routine Work Plan Process are: • Weekly schedule compliance • Planned vs. unplanned hours of work • Emergency person hours worked • Work order compliance with estimates • Execution of compliance with various plan terms • Compliance to Work Plan Types • Re-scheduled/ Re-planned work orders • Preventive Maintenance Coverage • Wrench Time

Newfoundland and Labrador Hydro Group
Routine Work Flow

ROUTINE PROCESS FLOW DETAILS

Work Request Status Code 01 | 04 10 | 11 14 | 14 30, 31, 32, 33 35 44 | 44 46 46 | 46 48 70 | 70 80 90

1. Work Identified
2. Assess Urgency?
3. Initiate Work Request As Soon As Practical
4. Initiate Work Request
5. Initiate Work Request
6. Review Request For Acceptance
7. Feedback Reason For Rejection to Originator/ Dept
8. Approval (Scope)
9. Submit for Consideration in Future years (Plan Repository)
10. Minimal or Extensive Planning?
11. Verify / Clarify Job Scope. Identify Labour requirement. Identify Parts (No ordering or Reserving required)
12. Enter Into Planning Backlog
13. Extensive Planning Activity (Develop or Utilize existing Plans)
14. Approval Execute Work (Plan/ Cost)
15. Submit for Consideration in Future years (Plan Repository)
16. Feedback Reason For Rejection to Originator/ Dept
17. Input WMP (E)
18. Considerations (Material Delivery Dates , Tools/ Equipment Availability, etc.)
19. Material Required?
19A. Obtain Goods/ Services (Goods and Services Process)
20. Outage Required?
21. Flag In Backlog (Draft outage request)
22. Establish Target Start & target Completion Dates
23. Enter into Scheduling Backlog
24. Develop Preliminary Schedule
25. Can schedule Considerations be met?
26. Change Planned Start/Target completion Dates
27. Finalize/ Issue Weekly/Daily schedule
28. Develop Daily Schedule
29. Obtain Goods/ Services (Goods and Services Process)
30. Outage Required?
31. Coordinate with ECC/ Operations/ Customers
32. Communicate Schedule
33. Execute Work
34. Is Work Complete?
35. Is Work on schedule?
36. Can Work Proceed?
37. Re- Schedule?
38. Obtain Goods/ Services (Goods and Services Process)
39. Outage Required?
40. Coordinate with ECC/ Operations/ Customers
41. Capture Work details
42. Initiate Add/ Remove/ Transfer Asset Process
43. Asset Management
44. Work Plan Review Required?
45. Conduct review
46. Save Work Plan
47. Close Job
Produce Metrics

Communicate with other Departments
Coordinate Outage requirements with other Departments
To Planning Backlog Block 12
To Scheduling Backlog Block 23
Measure
Fast Track Planning
Establish Dates

INPUTS FROM WORK BUDGETS PROCESS
Work Plan & Schedule
Resource Plan
Financial Budget

Color Key of Responsibility:
- Any Hydro Group Employee
- Asset/ Business Unit Manager or Designate
- Planner/Planning
- Frontline/Tradesperson/ Worker
- Data Input
- Project Manager / Team
- Goods & Services
- On Call Supervisor, Supervisor/Asset/ B.U. Manager or designate, E CC

Step 1. WORK IDENTIFICATION | Step 2. NEEDS ASSESSMENT AND PRIORITIZATION | Step 3. PLANNING | Step 4. ESTABLISHING TARGET DATES | Step 5. SCHEDULING | Step 6. EXECUTE THE WORK | Step 7. CLOSE OUT AND REPORTING

JOB PROCEDURES

W.O. FLOW TYPE (Flow type #)

1. Corrective
- CREATE WORK REQUEST
- 48011 Work Request entry: -Enter Problem Description -Enter Equipment Tag Number -Enter Originator Employee # -Set Flow Type As "1" For Corrective Maintenance
- Assign Priorities: -1 or 2 For Emergency or Urgent -3 for High Priority Planned Work -4 for Work Later this year
- Reject Request: - Set status to 9f
- Apply Selection Criteria: -All work unless pre- approved is subject to the Corporation's selection criteria as administered by appropriate Asset manager. - Use work approval routing to direct work request to the appropiate approving authority
- Hold For Approval: - Status 01 for Review and Approval
- Assign Suggested Planned Completion Date: -for priority 3 & 4 Work Requests Managers should indicate a Planned completion date.

2. Prentative Maintenance
- CREATE REQUEST FOR NEW PM's
- Advanced Planning Menu: Create PM Schedules for each Equipment Tag # (I.d.). Enter Minimum requirements: -Service Type (What) -PM Frequency (When) Optional Details: -Procedures -Associated Service Types - Loops -Warranty -Unscheduled Maintenance -PM Management Functions
- Reference Model Work order with BOM (Parts & Labour)
- If model work order is not available

M. Model
- CREATE MODEL WORK ORDER
- Advanced Planners Menu: Create Model Work Order: Defaults to Flow Type "M" (Do not Change)
- To Create Model Work Order enter: -PM Description -Subsidiary -Planning Area -Type of Work -Department -BOM Reference
- Advanced Planners Menu: Once BOM is attached add: -Standard Labor Instructions -Standard Parts List
- Advanced Planners Menu: If BOM is Not set up Create a New BOM Via Inventory Item Master 41 04.

3. Non-Maintenance
- CREATE WORK REQUEST
- 48011 Work Request entry: -Enter Problem Description -Enter Equipment Tag Number -Enter Originator Employee # -Set Flow Type As "3" For NON-MTCE -Set Priority to "3" (Normal)

5. Small Capital Distribution Service Extensions
- CREATE REQUEST FOR SERVICE T/A
- 48011 Work Request entry: -Enter Description, Cust. Info -Set Flow Type As "5" Priority to "3"
- CREATE REQUEST FOR SERVICE CONSTRUCTION
- 48011 Work Request entry: -Enter Description, Cust. Info -Set Flow Type As "5" Priority to "3"

5. Small Capital Distribution Upgrades
- CREATE REQUEST FOR UPGRADE (T/A)
- 48011 Work Request entry: -Enter Description, Cust. Info -Set Flow Type As "5" Priority to "3"
- Work Approved and Included in Work Plan. Usually Initiated by Planning.
- New work to be considered?
- CREATE REQUEST FOR UPGRADE CONSTRUCTION
- 48011 Work Request entry: -Enter Description, Cust. Info -Set Flow Type As "5" For Capital &Priority to "3" (Normal)

- Planning Inputs: - F6 Parts/ Service - F8 Labor/Tasks - Standard Procedures -Other Information as Required (See Notes Below for MP/EP) Advance Work Order
- Holds For Planning: - 20 Eng./Tech Services Required
- Release PM WO: Advanced Planners Menu: Generate Scheduled PM's on a predetermined frequency. Or Force PM Work Order
- Cost Approvals: - Cost approvals by routing (w/o status) or other means as designated by appropriate manager
- Hold For Cost Approval: - Status 11
- Planning Inputs: - F6 Parts/ Service - F8 Labor/Tasks Advance Work Order
- Order Parts/ Services and Confirm Delivery to Establish Target Start Dates: WO F6 Parts List: -Goods and Services Lead Times for Stocked Parts. - Follow up Informa tion (w/o) Requisitions (3 Digit type 9) - Delivery Information (opt ion 11) for 3 digit type N WO F16 Record Type Review: - "H" Expediting T ext - "C" Tools & Equipment Status - "P" Planning Status
- Holds For Staging and Scheduling: - Parts: Status 31,32,33 - Scheduling: Status 35,44 Enter The Plant Condition Code on W/O: SD (Unit Outage), EO Equipment Outage, EC Equipment & Customer Outage
- Review Backlogs : Work Order (Scheduling) Backlog W/O 48 201: -Query by department, Waiting to be scheduled status 44 by Planned Start date and/ or Planned completion date. Consider in progress w ork spanning several weeks. - Query on Plant Condition for work Orders requiring Outages or Equipment Shut Down - The field or Plant Condition will have to be populated on the work order before placing it in the Scheduling Backlog (Status 35 or 44).
- Balance Schedule- Assign start dates: -Update start dates - Advance work order status to 45 weekly schedule
- Scheduling Tool: - Interim: Excel spread sheet updated with data from JDE Future considerations: Link to MS Project or other Scheduling Software.
- Scheduling: Enter Into scheduling Backlog
- Scheduling: Enter into scheduling Backlog
- Print weekly Schedule: -Provided by scheduler (Query) - 48201 W/O Backlog : - Work orders in status 45 with start dates for the week of execution. -Move Work Orders to Status 46 Daily schedule.
- Snapshot of Finalized Weekly Schedule: - The finalized/ approved weekly schedule is filed (electronically) and used for compliance measurements.
- Work in Progress: -Advance Status of work orders to status 48.
- Review/ Monitor/ Report Work Progress: -Update Status of work order.
- Execute Work: - Work orders are advanced to status 48 In Progress
- Execute Work: -Do line layout -Prepare Pole Schedule -Prepare Drawings -Prepare Joint Use Forms -Obtain Easements etc.
- Holds For Technical: -Waiting Customer Response status 13
- Work is Complete: 48011 Work Order Entry: - Input Completed date On Work orders - Advance Status of work order.
- Holds For Data Inputs : - Status 70 Completed waiting information.
- Data Entry : - Time Entry Via timesheet for Actual Labour. 48011 Work Order Entry: - Meter Readings are recorded as required. - Record History: Actual work Performed
- Close Work Order : 48011 Work Order Entry: - Advance Work Orders to status to 90.
- Data Entry : Asset Add/Remove : -Add New Assets -Record Equipment Spec s -Record Name Plate Data -Serial # etc. - Remove Assets -Financial information
- Copy Package To Planning: -Email pole schedule and drawing to Planning. -Originals to central file
- Future Considerations: -Document Filing System (Electronic)

Work Identification:
Consideration s:
-Master Work Plan For The Five(5) Work Plan Types.
-Work Identified by Any Hy dro Group Employee or Stakeholder.

Needs Assessment:
-Assessment Criteria like:
Asset reliabilit y improvement
Environmental improvement
Health and Safety improvement
Availability improvement
Legislative / Regulatory
Knowledge a nd Experience
Maintenance Standards Achieve d or Kept (PM)
Customer Service Impact (Reliability)
Maintain Infrastructure to accepta ble standards
Service Level Agreements

Extensive Planning
Action/Considerations:
-Verify/Define Scope of Work
-Provide Labor Estimates by Craft
-Identify, Specify & Order Parts
-Identify/Arrange Special Tools
-Arrange Equipment Outages
-Include Procedures, Drawings, Sketches, and/or Pictures
- Identify/ Arrange Special Permits
-Consider Legislative Requirements
-Consider Safety, Health and Environmental Standards
-Co-ordinate with other departments
-Arrange Transportation/ Accommodations
-Develop CPM or PERT Chart for multi-task with critical components (eg. shutdowns, un it PM's)
-Customer Impact & Coordination
-Contingency Plan
-Reliability/ Security Impact
-Energy Supplier Coordination (NUGS)
-Process changes as a result.

Minimal Planning
Action/Considerations:
-Verify/Define Scope of Work
-Provide Labor Estimates by Craft
-Parts; No Ordering or Reserving Necessary.

Basis For Determining Target Start/ Planned Completion Dates
Considerations:
-Master Work Plan schedule
-Parts/ Material Delivery Dates (Expected)
-Labor and special tools availability
- Availability of Work Details (Drawings, Procedures, etc)
-Seasonal weather
- Service Level Agreements/ Contracts
-Final Eng. Design Details
- Coordination with other Depts.
-System Security
-Operating Cost (fuel for Auxiliary)
-Energy Supplier Coordinatio n (NUGS)
-Outage Confirmation or availability of Equipment fo r Outage
-Customer Coordin ation

Basic Scheduling Principles For Maintenance
Considerations:
1. Review Waiting to be Scheduled & Outage Backlog to develop Pr eliminary Schedule.
2. Develop weekly schedule based on a forecast of available hours, Wo rk order priority, target start dates.
3. Consider any work having the potential to escalate in priority to an undesirable situation for immediate inclusion into the s chedule.
4. Stakeholders to be given the opportunity to have input into the wee kly schedule.
5. The crew supervisor handles the current day's work and problems even to rescheduling the entire crew for emergencies.
6. The schedule should have a good mix of work.
7. Schedule compliance will be mea sured .
8. The supervisor will make schedule changes to accomodate emergency work.

Doing Work
Considerations:
1. Follow Safety & Health and Environmental Pro cedures.
2. Follow Approved Work Practices.
3. Follow the Work Plan and Perform Quality Work
4. Supervisor makes decisions on unforseen work that occurs during work in progress.
5. Supervisor Deals with Work Plan Problems on a Daily Basis.
6. Communicate any changes to operations.

Feedback and Reporting
Consideration s:
1. Enter details of actual work performed.
2. Identify any additional work and initiate wo rk request.
3. Provide feedback to planning outlining any problems, p lan changes or other helpful information that may improve future plans and sc hedules.
4. Review Modify and Save work plans for fut ure use.
5. Ensure Completion dates are added and are accurate.
6. Update Drawing, Procedures and Manuals.

Work Execution Process

Prepared By: Work Execution Process Improvement Team	
Approved By : S.M.I.T.	Date Approved:
Revision: 04 - R01	Date Revised: 2004 - 12 - 01
	Chart No.: WE - 001

People Powered Performance

Newfoundland & Labrador Hydro
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Project Work Process Flow Chart

Process Flow Major Activities

Planning		
No.	**Name**	**Description**
1	Review/ Confirm/ Approved Work Plan	The individual who has been appointed Project Manager is responsible and initiates this activity. The Project Manager will review all components of the Approved Work Plan Package with the customer and make all necessary changes before proceeding with the work execution process. The Approved Work Plan will be made available to Work Execution after Cross Divisional Approvals have been completed. The components of the plan will include the following: • **Scope Statement** – The scope statement provides a documented basis for making future project decisions and for confirming or developing common understanding of project scope among the stakeholders. As the project progresses, the scope statement may need to be revised or refined to reflect approved changes to the scope of the project. • **Project Justification** – The business need that the project was undertaken to address. • **Objectives** – The quantifiable criteria that must be met for the project to be considered successful. Project Objectives must include at least cost, schedule and quality measures. • **Work Breakdown Structure (WBS)**- the work breakdown structure is the basis for determining required tasks or activities for all resources, vendors, services, or any other

Planning		
No.	**Name**	**Description**
		identifiable entity needed to complete the project. At its highest level, the work breakdown structure is the approach by which the objectives are to be met. The lowest level of the work breakdown structure defines specific tasks or activities to be performed and resources required. • **Deliverables** – a list of summary level sub products whose full and satisfactory delivery marks completion of project. For example, the major deliverables for a software development project might include the working application, a user manual and a tutorial. • **Assumptions** - Factors that, for planning purposes, are considered to be true, real or certain. Assumptions affect all aspects of project planning, and are part of the progressive elaboration of the project. Project teams frequently identify, document and validate assumptions as part of their planning process. For example, if the date that a key person will become available is uncertain, the team may assume a specific start date. Assumptions generally involve a degree of risk. • **Constraints** - A constraint is an applicable restriction that will affect the performance of the project. For example, a predefined budget is a constraint that is highly likely to limit the team's options regarding scope, staffing and schedule. When a project is performed under contract, contractual provisions will generally be constraints.

Planning		
No.	**Name**	**Description**
		• **Project Schedule -**The Project Schedule must include major project activities and milestones, activity duration estimates, activity sequencing and tentative start and finish dates. • **Resource Plan** -The resource plan must include the physical resources (people, special tools, equipment, materials), quantities of each required and date required to perform project activities. • The resource plan must be closely aligned with project major activities identified in the work breakdown structure and schedule. • The people requirement in the resource plan must be identified by craft and quantity of each craft to conduct the activity. • The resource plan must also indicate the project activities that will be completed by contractors. • The procurement for Goods and Services must include long lead items, goods and services resulting in extra ordinary demands on inventory and specialty items. • **Outage Plan** - The outage plan must include: • Equipment/assets affected by the outage. • Duration of outage. • Tentative start and finish dates, determined by consulting with Area Planning Departments and Energy Control Center

Planning		
No.	**Name**	**Description**
		/Operations/Hydro Quebec. • Participants in outage i.e. (IS&T, TRO etc) • Other work that may impact the outage. **Budget Plan –** The project budget plan must be: • A reflection of the activities in the work breakdown structure. • Must be broken out into budget amounts by cost category. • Must include cash flow based on project work plan.
2	Site Visit Required	The Project Manager in consultation with customer representative(s) will decide if a site visit is required to complete the review and confirm the approved Work Plan Package. • If a site visit is required, the Project Manager will arrange a meeting with the customer representative(s). • If a site meeting is not warranted, the Project Manager will make alternate arrangements with the Customer to review and confirm all components of the plan. Alternate methods might include e-mail, phone conference, etc.
3	Meet with Customer Representative(s)	The Project Manager will meet with customer representative(s) to review/confirm the approved Work Plan Package. • The customer/owner will determine how many customer representatives will attend the meeting.

Planning		
No.	**Name**	**Description**
4	Is the plan OK	When the project review is complete, the Project Manager and Customer Representative(s) will decide whether to proceed with the project as per the approved work plan package. The decision is based on results of the review. • If the Project Work Plan Package is acceptable with no or minor changes, the Project Manager and Customer Representative will sign off on the plan. • If the Project Work Plan Package is not acceptable, and major changes are required, request change and seek re-approval.
5	Seek Re-approval Request Change	If project changes are significant such as major scope or budget change, the Project Manger will request the changes and return project to WI&P for re-evaluation and re-approval.
6	Sign Off on Approved Plan	When Project Manager and Customer agree that plan is acceptable, they will sign off on plan.
7	Project Setup	When the Asset/Business Unit Manager has signed off on the Project, the Project Manager will proceed with the Project Set-Up. • The Project Manager is responsible to confirm that the budget has been set with the proper account code structure and estimates based on the project major activity list. When the WI&P and Work Budgets Process are implemented, the budget including the account code structure will be uploaded automatically as part of Work Budgets Process. Until these two processes are implemented, the Project Manager in consultation with the Asset/Business Unit Manager will ensure the budget is uploaded manually. • After the budget is uploaded to JDE, the Project Manager, the Asset/Business Unit Manager and

Planning		
No.	**Name**	**Description**
		area Planning Supervisor will consult with each other to determine the appropriate work orders to be put into JDE. The work orders will normally be aligned with the project activity list and shall include labor by craft, material requirement and minor/major contract requirement. The bottom line is that there must be an adequate number of work orders to manage and control the execution of work. Setting up work orders in JDE for execution of Project Work is essential. It's the media through which the customer: • Identifies, initiates, and describes work. • Prioritizes and approves work • Identifies & manages resources • Identifies Goods and Services Requirements. • Tracks and manages cost • Captures work history • Links cost and work order history to assets • Plans and Schedules work • Builds resource plans • Build work plans • Gathers data to analyze equipment failures and unacceptable budget variances.
8	Stakeholder Meeting	This meeting is arranged by the Project Manager and where practical should include all stakeholders. The purpose of the meeting is to: • To discuss project scope, project schedule, resource plan, outage plan, budget plan and any other applicable information. • To confirm/establish team members. • To outline roles and responsibilities of team members. • To develop a communications plan, which involves determining the information and communication needs off the stakeholders: who

Planning		
No.	**Name**	**Description**
		needs what information, when will they need it, how will they get it, and who gives it to them. (Refer to Appendix "C" for template of Communication Plan. • Assign responsibility for long lead items if not already assigned.
9	Act on Long Lead Items	Order long lead items sufficiently in advance to meet project start date.
10	Use Goods and Services Process	Request/Order Goods and Services sufficiently in advance to allow Materials Management adequate time to procure in time for planned start date.
11	Complete Detailed Engineering Design	Completing detailed Engineering Design involves: • Completing technical design work • Preparing equipment purchase/install contracts. • Preparing engineering drawings. • Preparing bill of materials. • Determining/arranging manufacturer requirements. • Developing pre-commissioning and commissioning checks. • Co-coordinating outage plan with Customer, ECC or Operations/Hydro Quebec. • Fine-tuning project schedule and project resource plan.
12	Review Final Design Package with Customer/Owner	Project Manager reviews final design details with customer/owner to ensure the design meets expectations and is within the project scope, schedule and budget.

Planning		
No.	**Name**	**Description**
13	Is Final Design OK	The Project Manager is responsible to obtain customer approval of the final design. • If the design is ok and no changes are required, the Project Manager will move forward with finalizing project plan details. • If minor changes are required, the Project Manager will be responsible for making those changes prior to finalizing project plan details. • If the final design is not ok and major changes are required i.e. scope, budget etc, then the Project Manager will document the change and resubmit to WI&P for re-evaluation and re-approval as indicated in the process flow chart.
14	Review/Modify Design	This step of the process is intended for minor revisions/modifications only and can be addressed between the Project Manager and the Customer. Even when minor changes are made, the Project Manager must revisit to see if other long lead items have been identified as a result of design change.
15	Finalize project plan details	Finalizing Project Plan Details normally includes the following: • Identify the asset(s) and add to asset master using Lotus Notes Asset Management Database. Add mandatory and other known information. Any additional information shall be added at project closeout. • Refer to procedures in Asset Record Management Process. • Confirm goods and service delivery dates. Major Contract Management may be required. • Arrange/confirm outage dates. • Arrange/confirm special tools. • Identify/arrange special permits, i.e. environmental, navigable waters, etc. • Identify/arrange orientation meetings. • Check availability of all resources (internal and external labor, tools & equipment, materials, etc.)

Establishing Target Dates		
No.	**Name**	**Description**
16	Establish/Confirm Target Start/Completion Dates	During the planning process, tentative start finish dates would most likely have been established. Now that all project plan details have been completed, the Project Manager is responsible to confirm existing dates or establish new ones. Communication with local planning departments is very important at this time. At this stage all long lead items would have been ordered and possibly other specialty items. All additional material can now be ordered to meet target start dates. When the job is ready to be scheduled, it's moved to "waiting to be scheduled backlog" (Status 44).

Scheduling		
No.	**Name**	**Description**
17	Can Schedule considerations be met	Scheduling of planned work of all types including capital and operating is done on a weekly basis. Planners extract work orders from the planned backlog based on priority, target start date, master schedule etc. As with all work, a final check is made to ensure all considerations can be met before committing to the weekly schedule. i.e. outage, manpower availability, material availability etc. If all considerations can be met, the work is moved to the weekly schedule.
18	Can Planned Target Start/ Completion Dates be changed?	If for some reason the project cannot be scheduled as per the plan, the Project Manager must: • Re-evaluate and adjust target start/completion dates. • Communicate with Project Manager/Team on changes to planned target start/ completion date. • Return to "waiting to be scheduled backlog". • If for some reason the project cannot be rescheduled for that year it must be redirected to the WIP process for re-evaluation.

Scheduling		
No.	**Name**	**Description**
19	Develop/Follow Weekly Schedule	A Weekly Schedule Generator is used to load a schedule to capacity. Asset and labour managers to sign-off on schedule. • Schedule is normally loaded for a planning center and department • Schedule will normally include new planned work; carry over work and standing work. • Schedule will normally include a good mix of project work, routine work and high and low priority work. • When the schedule is loaded to capacity, a snapshot is taken before it is forwarded to the Frontline Supervisor for execution. Compliance to schedule is measured each week.

Execute the Work		
No.	**Name**	**Description**
20	Execute Project Plan	It's the responsibility of the Frontline Supervisor and Crew to execute the plan. The supervisor is responsible to address all issues associated with the weekly schedule.
21	Communicate Progress	The communication plan determines what information is required, who needs it, who is responsible to communicate it, the frequency at which it is required and the medium through which it is received.
22	Progress Reports	Progress Reports are submitted as per the communication plan.
23	Is Progress Acceptable	The project manager and frontline supervisor(s) determines if progress is acceptable by monitoring schedules, budget and the quality of work. If project progress is acceptable, continue to execute the plan. If unacceptable, the question must be asked, can project proceed.

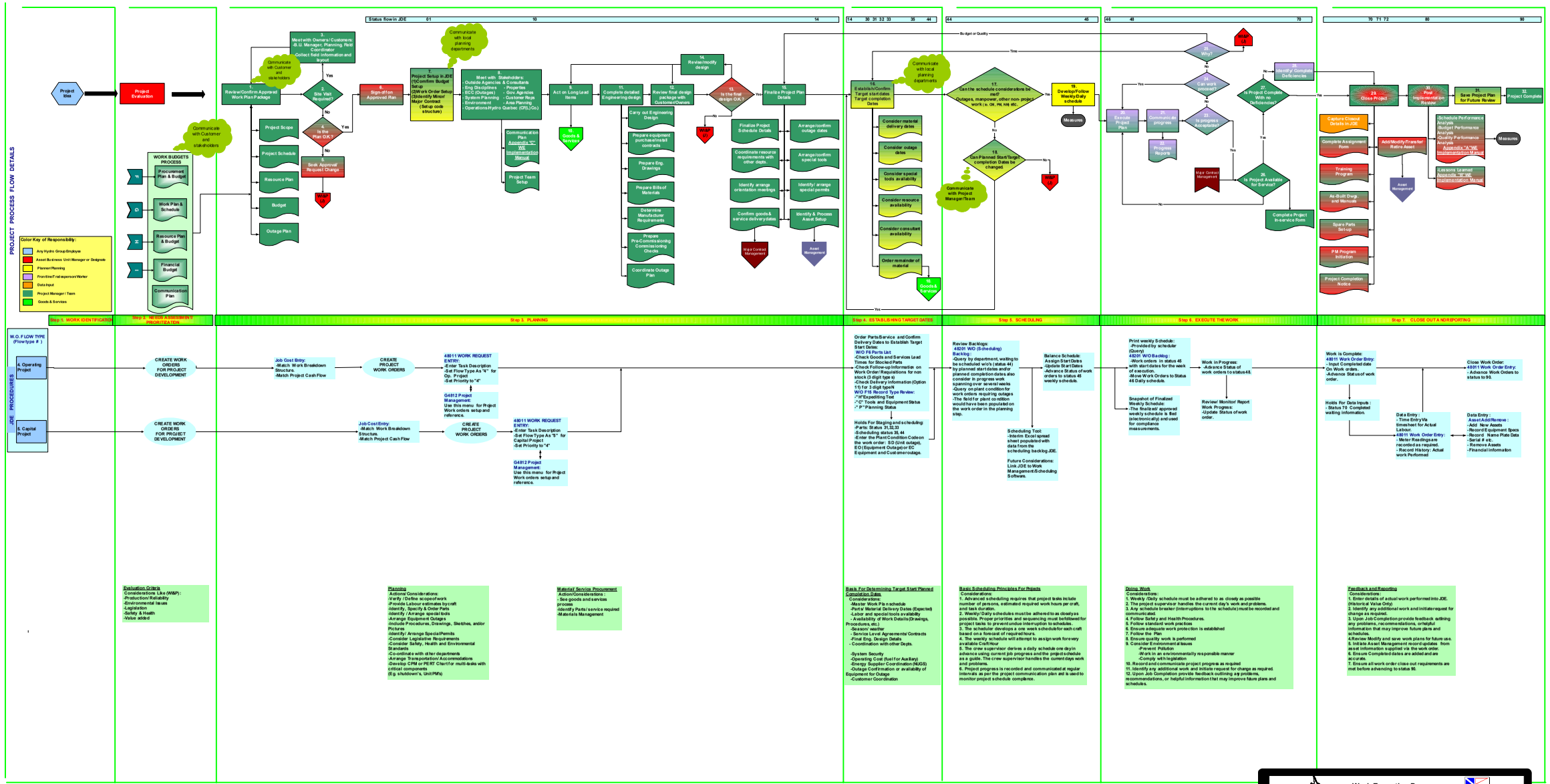
Execute the Work		
No.	**Name**	**Description**
24	Can Work Proceed	Although progress may not be acceptable, the Project Manager and Frontline Supervisor will determine if project can proceed. If yes, crew will continue to execute plan. If project cannot proceed, Project Manager must address the question "Why"
25	Why can't project proceed?	The Project Manager must determine why work can't proceed. There may be several reasons but the most common reasons are: • Major changes to project scope. When major scope changes are required, project must return to WI&P Process for re-evaluation. • Major budget overruns or projection of major budget overruns. Budget overruns or projection of overruns may be the result of inadequate budget estimates or unforeseen circumstances. This will again involve re-evaluating the project. • Time related problems. There may be cases where unforeseen circumstances will prevent the project from proceeding. Example (Outage cancelled or shortened.)
26	Is project available for service	• The project manager must determine when the project is available for service. To be available for service, all major work must be complete including function testing and commissioning. Project manager is responsible to ensure that prior to releasing System Equipment for Service, all conditions in Operations Standard Instruction #053 (Release for Service of System Equipment) have been met. There should be no issues affecting its in service capabilities but there may be minor deficiencies or minor work that does not affect its in service capacity. If it's not available for service, then proceed with execution of plan. If it is available for service,

Execute the Work		
No.	**Name**	**Description**
		proceed to next step of process. Complete Project In-Service and Interest Cut-Off Notice (Form 60-537 R00-02. This is authorization to discontinue project interest (IDC) as of that date. • Project Manager should ensure adequate funds are available to address any deficiencies that could be outstanding on the project.
27	Is project complete with no deficiencies	If there are no deficiencies, proceed to project closeout. If there are deficiencies, properly address before closing project.
28	Identify/complete deficiencies	If there are deficiencies, the Project Manager must ensure they properly addressed before closing out the project.

Closeout and Reporting		
No.	**Name**	**Description**
29	Close Project	There are many activities that must happen as part of Project Closeout. • The JDE work order details such as actual work performed and actual completion dates must be added to work order and input to JD Edwards. The details are the responsibility of the Supervisor(status 70) and the input is the responsibility of the input clerk.(status 80) • Add, modify, transfer, retire asset(s) using the Lotus Notes Asset Record Management System. • Complete Asset Assignment Form. This is a new Asset Record Management Form, which is required by Finance to allocate funds to the applicable assets for the purpose of depreciation. Completion of this form is the responsibility of the Project Manager in consultation with the Asset/Business Unit

Closeout and Reporting		
No.	**Name**	**Description**
		Manager. Refer to appendix (E) for blank template. • As built drawings and manuals must be provided before Project Completion Notice is submitted. • Spare parts must be identified and set up before Project Completion Notice is submitted. • Preventive Maintenance Program must be set up before project completion. This will be the responsibility of the Asset Manager. • Training Programs, which were identified as part of the project, must be completed before Project Completion. Training costs incurred by the project normally includes program development and execution costs. Employee training expenses normally comes from the operating budget.
30	Post Implementation Review	• Schedule performance analysis. • Budget Performance analysis. • Quality Performance Analysis. • Lessons learned.
31	Save Project Plan for Future Use	If there is valuable information in this project plan that may be used for future use, it should be saved. Any work order information will be saved in JDE. Additional information will have to be saved elsewhere.
32	Project Complete	All Work Order Records will be moved to status 80 (complete). W/O will go to Status 90 after three months by automatic JDE process.

Newfoundland and Labrador Hydro Group
Project Work Flow



Newfoundland & Labrador Hydro
Group of Companies

ROLES & RESPONSIBILITIES

Long-Term Asset Planning Manager

Maintenance Supervisor Maintenance

Worker

Operations Manager

Operations Supervisor

Operations Worker

Planning Supervisor

Planner

Planning Clerk

Scheduling Supervisor

Work Execution Manager

Roles & Responsibilities

Long-Term Asset Planning Manager

Summary of Job Function

Leads LT asset planning and critical spares management activities. Accountable for developing and refreshing the 20+ year asset plan addressing asset rehabilitation / overhaul, renewal and replacement. Drives development of annual asset work plan and provides oversight and input into effectiveness of asset maintenance activities including preventative and predictive maintenance.

Principal Activities, Duties and Responsibilities

1. Develop and continually refresh 20+ year asset plan that reflects: asset rehabilitation/overhauls to major assets; asset renewal requirements – what needs to be replaced, when and with what.

2. Create/maintain accurate & complete asset listing/hierarchies with supporting detail, location, history, financial information.

3. Translate 20 year asset plant into detailed 5-year and annual asset work plans; update as required.

4. Recognizing the dynamic nature of long and short-term asset work plans and the expertise of others, obtain input from work execution and operations functions when developing/refreshing long-term, 5-year and annual asset work plans.

5. Participate in technical councils and use councils to test long-term plans, promote their role in operational trouble-shooting.

6. Develop high-level implementation strategy including financial leveling, resource planning for each year of the LT asset plan.

7. Drive development of the 20 year capital plan inputs for assets.

8. Check/ensure alignment with corporate long-term asset planning practices led by the office of asset management.

Roles & Responsibilities

Long-Term Asset Planning Manager continued…

9. Ensure project scope, estimates and quality are acceptable.

10. Identify and monitor asset reliability / service level requirements.

11. Complete root cause failure analysis and remedial action plans.

12. Complete risk assessment and reliability monitoring.

13. Develop, monitor and continuously improve preventative and predictive maintenance programs.

14. Develop and implement condition assessment tools and monitoring techniques, incorporate results into planning activities.

15. Monitor and incorporate industry and technology trends impacting long-term asset plan.

16. Use critical spares framework established by the Office of Asset management to identify critical equipment/tools spares based on criteria including: acceptable downtime/service levels; impact to reliability; delivery time; failure history; and repair duration.

17. Determine quantity, lead times, and optimum inventory levels.

18. Initiate the procurement of critical spares and ensures correct equipment is specified, ordered and received.

19. Develop necessary inspection/review/maintenance/location requirements on critical equipment/tools spares to ensure readiness including monitoring OEM supplier support and equipment/tools availability.

Roles & Responsibilities

Long-Term Asset Planning Manager continued…

20. Participates in post implementation reviews of project work.

21. Participates in the cancellation of PM's.

Roles & Responsibilities

Maintenance Supervisor

Summary of Job Function

Drives Work Execution Efforts through execution of weekly work schedules. Supports planning efforts by aiding planner in producing efficient work packages. Responsible to ensure workers under his/her direction perform activities in a safe and efficient manner. Participates in the weekly scheduling meetings.

Principal Activities, Duties and Responsibilities

1. Provide planning with craft hours available forecast for next Week's work schedule.
2. Communicates weekly/daily schedules to employees.
3. Assigns work orders to individual workers.
4. Ensure that Tailboard Safety Talks are completed during work assignments, or ensures persons are assigned lead to conduct.
5. Ensures all special permits are in effect.
6. Follows work plan packages produced by planning.
7. Resolves daily work plan package problems.
8. Adjusts daily work schedule to handle emergency work.
9. Monitors work in progress with respect to schedule, budget and quality.
10. Makes decisions on unforeseen events that occur during work in progress.
11. Ensures safety and health, environment and regulatory requirements are followed.
12. Co-ordinates returning of equipment to operations, returning surplus parts to inventory, and returning tools to tool crib.
13. Communicates to Operations any changes that were a result of work done.
14. Evaluates close out data on work orders and ensures all work orders are returned to planning including PM check sheets.
15. Generates work request for any additional work identified.

Roles & Responsibilities

Maintenance Supervisor continued…

16. Moves work orders through JDE status indicators from 45 to 71.

17. Returns last week's schedule to planning indicating jobs completed & Break in List

18. Explains variances in weekly schedule if required.

19. Responsible to ensure changes to equipment, system or process are approved by Long Term Asset Planning prior to making change.

Roles & Responsibilities

Maintenance Worker

Summary of Job Function

Part of the work Execution Team. Performs work on assets under the direction of the FLS (front line supervisor). Responsible for conducting work in a safe and efficient manner following all corporate policies and guidelines. Assist in the development and assessment of work methods.

Principal Activities, Duties and Responsibilities

1. Responsible to understand scope and technical details of work.
2. Ensures safety, health; environmental and regulatory requirements are understood and followed.
3. Follows approved work practices; including Work Methods, TBRA's, etc.
4. Follows work plan and where specific procedures are not provided, use knowledge, skill and expertise to perform the work in a safe, efficient and effective manner.
5. Responsible for administering Trades Administered Work Permits.
6. Works within schedule and labour estimates provided in the work plan package.
7. When working at plants, structures, or stations, ensure the proper authorities are aware of work being done.
8. Notifies proper authorities of any changes that affect production/operation as a result of work that was done.
9. Ensures equipment has been checked and tested before release for service.
10. Returns unused parts and tools to proper location.
11. Records asset tracking information as per information on work request.
12. Provides feedback on work plans package to planners.
13. Reports actual work performed on work orders.
14. Initiates work request for additional work activities.

Roles & Responsibilities

Operations Manager

Summary of Job Function

Leads the safe operation of assets in accordance with the basis of design and established operating parameters.

Principal Activities, Duties and Responsibilities

1. Focus on safe, environmentally friendly and efficient operation of the assets of utilization of the resource.
2. Monitor asset performance for proper operation to minimize potential for loss.
3. Monitor asset efficiency and performance, adjust operations as required.
4. Lead / provide input for outage management with particular attention to customer requirements.
5. Administer Work Protection Code for Production related operations.
6. Collect and maintain appropriate operating (condition) data for technical analysis and other uses.
7. Maintain effective relationships with customers.
8. Develop / maintain operating procedures, drawings and other documentation.
9. Recognizing the dynamic nature of long and short-term asset work plans and the expertise of others, provide input to long-term planning function (developing / refreshing long-term, 5-year and annual asset work plans).
10. Responsible for assigning/approving priority ranking to work orders using the Routine Work Management Process.
11. Provides input to weekly schedule development.
12. Reviews and approves unit/equipment outages.
13. Responds to emergency work situations and co-ordinates activity as required.
14. Responsible for initiation of training program on new assets.
15. Review Work Activity versus Work Plan as per frequency established in area.

Roles & Responsibilities

Operations Supervisor

Summary of Job Function

Directs activities of the Plant or Town operations group. Directs operation of assets to ensure they are operated in a safe environmentally manner. Responsible for application of WPC and outage schedule

Principal Activities, Duties and Responsibilities

1. Directs the activities of Operations Personnel.
2. Provides technical guidance to operating personnel.
3. Provides Work Protection Guidance to Operating Personnel.
4. Attends weekly co-ordination meetings to discuss and prepare for operating requirements for next week's work schedule.
5. Communicates work requirements to operating personnel in advance to eliminate delays during the execution of work.
6. Review work order backlog for work that affects or has potential to affect operations / production and use as input to weekly schedules.
7. Maintain a current knowledge on the latest maintenance technology applicable to the technical and operation area of responsibility.
8. Provides Long Term Asset Planning with accurate feedback on asset performance

Roles & Responsibilities

Operations Worker

Summary of Job Function

Part of the Asset Management Team. Responsible for operating assets in a safe and efficient manner within the assets operational parameters. Monitors condition of assets and reports abnormalities to Operations Supervisor.

Principal Activities, Duties and Responsibilities

1. In Production area, responsible for administering Operator Administered Permits.
2. In Production area, controlling Authority for work on equipment under their jurisdiction.
3. Participates in testing of equipment under their jurisdiction if required.
4. Responsible for operating inspections on equipment.
5. Responsible for initiating work requests for deficiencies found on equipment/ systems.
6. Participates in run up and / or testing of equipment that was worked on prior to release for service.
7. Participates in pre-start operational checks.
8. Performs identified running maintenance activities.
9. Trend monitors critical equipment and initiates work request in advance of trouble.
10. Ensures applicable operating / isolating procedures are followed.
11. Following approved operating / isolating procedures.

Roles & Responsibilities

Planning Supervisor

Summary of Job Function

Lead the planning of work to deliver the work outlined in the annual work plan by developing 7 and 30 day work schedules. Determines resource, materials, tools and equipment requirements to complete planned work and generates work orders and other documentation to support work execution.

Principal Activities, Duties and Responsibilities

1. Ensures planners are adequately trained.
2. Co-ordinates development and ensures timely implementation of plans and schedules for work.
3. Directs/guides day-to-day planning and scheduling activities.
4. Conducts weekly co-ordination meetings.
5. Co-ordinates development of weekly and/ or daily schedules.
6. Works with the Scheduling Supervisor to co-ordinate development of CPM schedules for project type work.
7. Determines extensive vs. minimal planning requirement for work orders.
8. Performs quality assurance checks on planned work orders.
9. Ensures valuable work plan packages are reviewed, upgraded and saved for future use.
10. Provides guidelines for planner's involvement in emergency work.
11. Liaison for co-coordinating work/outages with Operations Manager and Project Construction Co-ordinator.
12. Responsible for compiling information on metrics.
13. Accountable for the delivery of the Annual Work plan in conjunction Work Execution Managers
14. Coordinates weekly schedules are established with right mix of work.
15. Gates work into Annual Work Plan.

Roles & Responsibilities

Planning Supervisor continued…

16. Verify readiness for next week's work for materials, resources, timing, and input from supervisors (weekly scheduling meeting).

17. Works with planners to establish any new target dates.

18. Meet with Operations, LTAP, and WEMs to discuss scheduled work that cannot be completed in established dates.

Roles & Responsibilities

Planner

Summary of Job Function

Prepares job plans for the Execution Group. Refines scope of work orders, plans and prepares work for scheduling and execution. Note that planner refers to the person planning the work and may refer to ta Project Manager, a Supervisor, Electrical Planner, Mechanical Planner, etc.

Principal Activities, Duties and Responsibilities

1. Makes fields inspections and determines appropriate job work scopes.
   - Site visits to determine exact scope
   - Note any complications for the work
   - Refine scope as required
2. Develops detailed work plans for work orders
   - Plans for Materials Required
   - Determine Labor Requirements & Time Estimates
   - Special Equipment Requirements
   - Accommodation Requirements
   - Develops CPM for multitask/multicraft work larger work
   - Special Permit Requirements
   - Safety Related Requirements i.e. work methods/regulations
   - Have materials kitted & delivered when work is scheduled
3. Establishes realistic target start dates for work orders.
4. Reviews, upgrades and saves work packages for future use.
   Responsible for collection of Weekly Schedule & Break in List
5. Aid development of weekly schedules in conjunction with work coordination
6. Provides technical assistance for maintenance personnel as required.
7. Communicates regularly with department frontline supervisors, work coordination and other stakeholders on work order planning and scheduling issues.
8. Participates in weekly coordination meetings.
9. Ensures equipment outages have been arranged.

Roles & Responsibilities

Planning Clerk

Summary of Job Function

Supports planning and work execution efforts by performing clerical duties for planning. Maintains several databases as required. Enters and files documentation as a result of planning and work execution efforts.

Principal Activities, Duties and Responsibilities

1. Keying work orders for work requests

2. Maintain & Populates(if required) following Databases;
   PCB Database
   High Pressure Welding Database
   Switchyard Leaks Database
   Training Database
   Vehicle History Database
   Vacation Database
   Regular Meeting Requests

3. Maintain written records supporting above Databases.

4. Form Maintenance.

5. Work order closeout & Work order Requests as indicated.

6. Assist in Accommodation/Transportation Arrangements as required.

7. Files completed PM check sheets.

Roles & Responsibilities

Scheduling Supervisor

Summary of Job Function

Accountable for the maintenance of the Annual Work Plan database and assists Planning Supervisor with co-ordination of all work within the Annual Work Plan.

Principal Activities, Duties and Responsibilities

1. Populates and maintains Primavera Database
2. Ensures all work is entered into Annual Work Plan
3. Tracks Activity Completion in Real Time
4. Tracks availability of Labor Resources in real time
5. Tracks availability of Non labor Resources in real time
6. Publishes Schedules as requested
7. Works with Planning Department to develop schedules and timelines
8. In conjunction with the Project Construction Co-ordinator, co-ordinate all work to ensure all resources requested are available
9. Alerts Planning Supervisor/Applicable Managers of any potential problems with the upcoming weekly and four week schedules
10. Tracks project execution and statistics

Roles & Responsibilities

Scheduling Supervisor continued…

11. Develops "What if" schedules to aid in evaluation of any changes to the Annual Work Plan.

12. Assists Project Co-ordinator with tracking of Project Activity Completion and alerts Project Manager of any potential problems with either projects or the Annual Work Plan Schedules.

13. Coordinates with PETs Planning Scheduler to ensure Capital work schedules are aligned with Annual Work Plan Activities.

Roles & Responsibilities

Work Execution Manager

Summary of Job Function

Leads the planning and execution of work plan in a safe, environmentally friendly and effective manner.

Principal Activities, Duties and Responsibilities

1. Focus on safe, environmentally friendly and effective (quality, cost, and schedule) execution of weekly, monthly and annual asset work plans.
2. Manage trades, tools and equipment resources required for work completion.
3. Integrate capital and operating project work including resource provisioning and associated commissioning coordination.
4. Prioritize work and monitor actual work completed against schedule; take action as necessary.
5. Supervise frontline supervisors.
6. Maintenance budget cost control.
7. Monitor maintenance execution productivity and effectiveness and monitor and report on work execution metrics.
8. Management and renewal of major contracts for equipment overhauls and minor service contracts.
9. Maintain effective record keeping (work order history and other work execution related documentation).
10. Recognizing the dynamic nature of long and short-term asset work plans and the expertise of others, provides input to long-term planning function (developing / refreshing long-term, 5-year and annual asset work plans).

Roles & Responsibilities

Work Execution Manager continued…

11. Responsible for assigning priority ranking to work orders using the Routine Work Management Process.

12. Performs regular reviews of work order backlog for delinquent PM work orders and other work orders with potential to escalate in priority.

13. Monitors size of planned work order backlog.

14. Provides input to weekly schedule development.

15. Review weekly work schedule compliance with supervisor.

16. Review work order estimates versus actual at work order level.

17. Participates in post implementation reviews of project work.

18. Provides technical guidance to labour force when required.

19. Responds to emergency work situations and co-ordinates work as required.

METRICS

Metrics simply means the measures and scores of particular process activities or results. Metrics involve selecting, collecting, analyzing, and presenting data.
In order to improve we must become an intelligent force behind an all-inclusive and a persistent development plan for the work execution process. To be an intelligent force means to become informed through the use of measurements. By comparing how well we are doing to other divisions within and to other companies we can establish meaningful targets for improvement. Communication of these targets is achieved through inclusion in annual divisional goals and objectives.

Indirect Measures

Doing the right thing somewhat ineffectively is more important than doing the wrong things very well. For example, how do measurements for the percentage of emergency hours worked and percentage of unplanned vs. planned hours worked apply to the success of work execution? The answer lies in this statement “If you are always putting out fires you will never reap the benefits of planning and scheduling”. Planning and scheduling are two key steps in the work execution process. The benefits of advanced planning and scheduling is in the reduction or even the elimination of delays. If we are always putting out fires then we are too reactive and steps need to be taken towards breaking that cycle and becoming more proactive. After we become confident that we are doing the right things we can put more effort into doing them well.

After the work execution process is implemented the 9 metrics identified in this section will help establish a baseline for improvement. The analysis of individual and combinations of these measures will highlight improvement needs.

Metrics associated with the Work Execution Process are:

- Weekly Schedule Compliance
- Compliance to Annual Work Plans
- Work Order Compliance with Estimates
- Emergency Person Hours Worked
- Planned vs. Unplanned Person Hours Worked
- Preventive Maintenance Coverage
- Percentage Re-planned Work Orders
- Percentage Rescheduled Work Orders
- Wrench Time

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Metric Title: **% Weekly Schedule Compliance**

Metric Background:
The primary purpose of the weekly schedule compliance metric is to provide a means of measuring weekly schedule compliance. This measure will be manually calculated to begin but electronically calculated in the future. The success of the Work Execution Process depends upon our ability to produce realistic, achievable weekly schedules that attempts to assign work for every available craft hour. Building these realistic weekly schedules is important but measuring compliance to these schedules is equally important.

Metric Definition:
The compliance to each work order will be measured individually and then averaged to give weekly compliance. The guidelines for measuring compliance are:

a. Work Order Completed during week 100%
b. Work Order not acted on 0%
c. Hours worked > hours scheduled 100%
d. Hours worked < hours scheduled (40 worked, 50 scheduled) 80%

Example Table: **4.0 Sample of Schedule Compliance Measure**

Total Available Hours = 200					
	Job #	**Hours Scheduled**	**Job Complete**	**Hours Worked**	**% Compliant**
	1	20	Yes	20	100%
	2	30	No	50	100%
	3	5	Yes	10	100%
	4	10	Yes	10	100%
	5	25	No	20	80%
	6	20	Yes	30	100%
	7	40	No	40	100%
	8	20	No	15	75%
	9	10	No	5	50%
	10	20	No	0	0%
Total	**10**	**200**		**200**	**805%**
Total Line #5 Divided by Total Line #1 805/10 = 80.5% Compliance with Schedule					

Supporting Information:
The schedule compliance will be measured and documented each week. Until we go with the electronic measurements, the area will have to make arrangements locally for storing and graphing the compliance data.

Frequency of Generation:
The weekly schedule compliance will be measured and documented on a weekly basis.

Generated by:
The Labor/ Business Unit Manager or designate will be responsible for documenting and compiling the data.

Target:
Industry Average is 80% or higher. Departments/Divisions will establish compliance targets as part of their annual goals and objectives.

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Metric Title: **% Work Order Compliance with Estimates**

Metric Background:
Two key components of work execution is effective planning (realistic labor and material estimates) and effective/efficient execution of the job (completing quality work on time and on budget). To see how well we comply with work order estimates, we have developed a metric, " Work Order Compliance with Estimates". The metric tells us what percentage of all work orders completed within a specified time frame was completed within an acceptable variance (+/_ 15%) of total estimated cost (labor, material, other cost). The variance field needs to be changeable as management may decide to change what is acceptable as the execution process improves.

Metric Definition:
% Work Order Compliance with Estimates =

$$\frac{\text{\# planned wo's completed within variance (±15\%) of total est cost}}{\text{Total \# planned work orders completed within specified time frame.}} \times 100$$

Supporting Information:
Specified time frame is the date range for which work orders were completed. Example January 1, 2005 thru March 31, 2005.

Work Orders completed are all work orders in the specified time frame that are at status 70 thru 95.

Planned work orders are all priority 3 and 4 work orders. They may include corrective, preventive, non-maintenance, operating and capital projects.

Total estimated cost includes labor cost, material cost and other cost.

Specified variance of +/- 15% of total estimated cost is what industry considers acceptable.

Total estimated cost includes estimated labor, material and other cost.

Prompts must include Planning Center, Business Unit, Dept/Section, Planner and start and end dates.

Example: Suppose 200 planned work orders (priority #3 & #4 of a corrective, preventive, non maintenance, operating or capital nature were completed (moved to status 70,80 or 90) in a specified time range (say January 1,2005 thru March 31, 2005 and say 75 of these work orders were completed within +/- 15% of total estimated cost:

$$\% \text{ Compliance to Work Order Estimates} = \frac{75}{200} \times 100 = 37.5\ \%$$

This means that of the 200 work orders completed during that time frame, 37.5% were completed within the acceptable variance of +/- 15% as compared to the target of 65%

Frequency of Generation:
This metric will be generated and documented on a quarterly basis. The first quarter report would be generated in mid April to capture timesheet entry data from end of March.

Generation #1Period	January 1st thru March 31st
Generation #2 Period	January 1st thru June 30th
Generation #3 Period	January 1st thru October 31st
Generation #4 Period	January 1st thru December 31st

Note: Generate the metric two (2) weeks after generation period end date to ensure the latest time sheet entry data.

Generated by:
The Planning Superintendent, Planning Supervisor or designate.

Target:
Industry average for work order compliance within +/15% of total estimated cost is 65%. The divisions within Hydro will establish their own targets.

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Work Order Estimate to Actual Variance (Summary Report Documentation)

Introduction

The Work Order Estimate to Actual Variance report was developed to provide a means by which a Panning Center may identify work order having suspect estimated and/or actual cost. The report utilizes the Showcase Strategy report writer. The BPI Work Execution team provided the criterion used to develop this report.

This report does not represent a comprehensive variance analysis process, but rather a tool used by the process.

Data Source

Report returns column data from the following JD Edwards WorldSoftware production tables:

- **F4801 Work Order Master**
  - WO Number
  - Description
  - Planning Center
  - Completion Date
  - Planner
  - Department
  - Type
  - Priority
  - Estimated Total Cost

- **F3111Work Order Parts List**
  - Estimated Materials Cost

- **F3112 Work Order Routing Instructions**
  - Estimated Labour Hours
  - Estimated Labour Cost (Hours * Rate calculation)

- **F0911 General Ledger**
  - Actual Labour Hours (Doc Type = T4)
  - Actual Labour Cost (Doc Type = T4)
  - Actual Materials Cost (Doc Type = II)
  - Actual Other Cost (Doc Type <> T2, T4, or II)
  - Actual Total Cost (Doc Type <> T2)

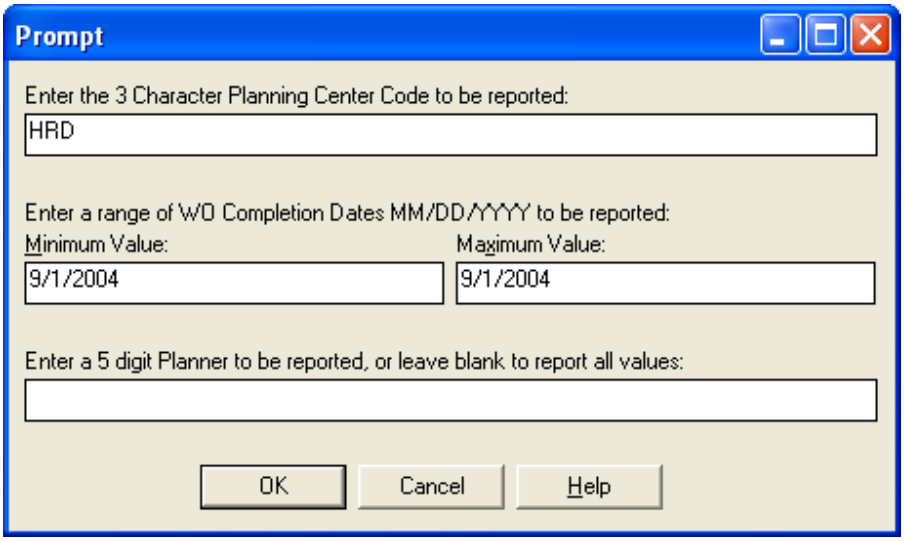
- **Calculated Report Column**
  - Variance (Actual Total Cost – Estimated Total Cost)

Data Sort & Totaling

- The report returns records for a Planning Center sorted in ascending order by Planner, Department.
  - Note: The SQL statement used by this report differs from that used by standard Showcase Strategy reports. This is due to the nature of the incoming report data, specifically the (many to many) relationship between tables. Therefore, the ability to perform extensive sorting may be limited.
- Data is grouped and totaled by (1) Work Order (2) Planner and (3) the entire report.
  - Note: Although the report appears to return a detail record by Work Order, it is in fact returning a summary record. This is based on the nature of the incoming report data.

Report Execution

Upon execution the report will prompt the user to supply values to three conditions. The first two conditions are mandatory, whereas the third is optional.



- The first prompt requests a 3-character value representing the Planning Center for which the report is to be executed. This value corresponds with the value contained by the Work Order's Category Code # 10.
- **Prompt for Business Unit**
- **Prompt for Department / Section**
- The second prompt requests a range of Work Order Completion Dates for which the report is to be executed. The form of the values must be MM/DD/YYYY.
- The third prompt requests a 5 digit value representing the Planner identification number. This value corresponds with the Planner field found on the Work Order master record.

Testing of the report for Planning Center HRD with a Completion Date range of 09/22/2004 – 09/23/2004 indicate execution times generally less than 3 minutes. Execution time may vary depending on system resource availability.

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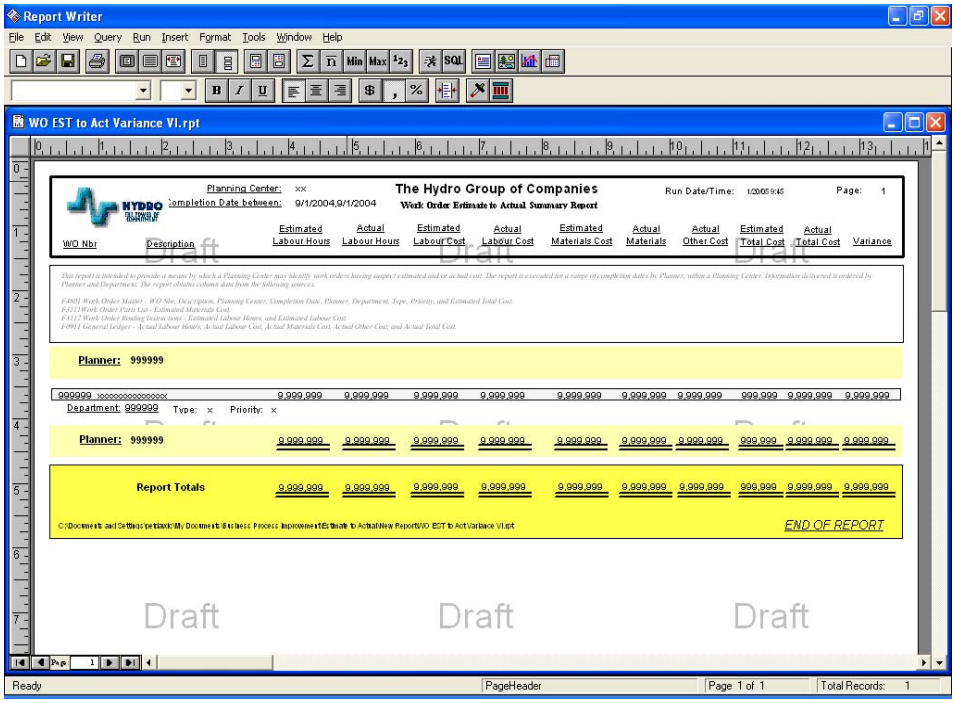
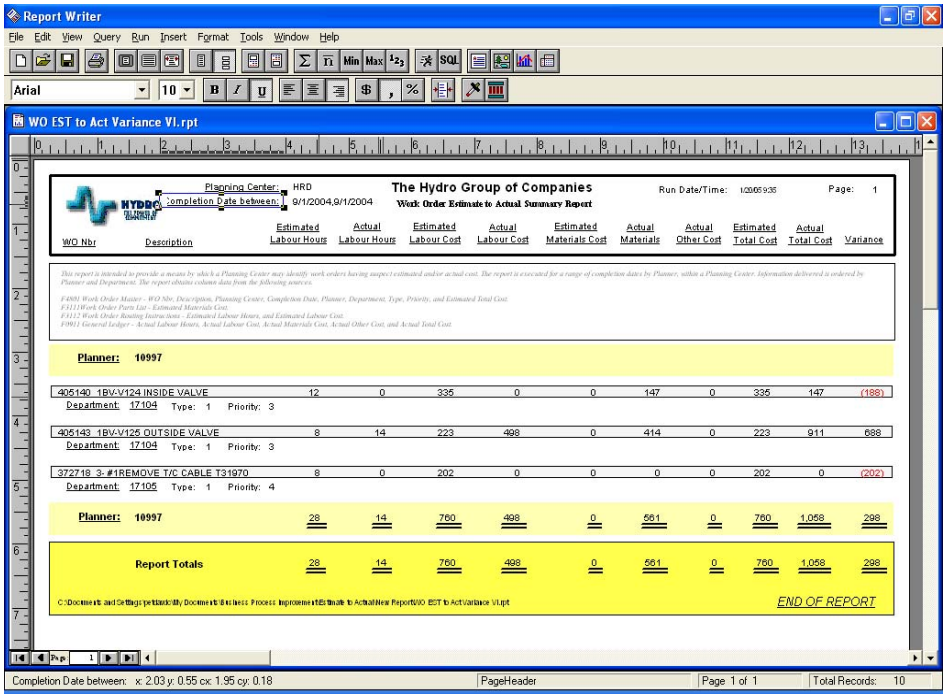
Sample Report Screen Shots





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Report Query Select Statement

```
SELECT
WAWR10 AS COLUMN0001,
WAANSA AS COLUMN0002,
WAANPA AS COLUMN0003,
Date( WASTRX, CYYDDD ) AS COLUMN0004,
WADOCO AS COLUMN0005,
WADL01 AS COLUMN0006,
WATYPS AS COLUMN0007,
WAPRTS AS COLUMN0008,
0 AS COLUMN0009,
0 AS COLUMN0010,
0 AS COLUMN0011,
0 AS COLUMN0012,
0 AS COLUMN0013,
0 AS COLUMN0014,
0 AS COLUMN0015,
WAAMTO AS COLUMN0016,
0 AS COLUMN0017,
0 - WAAMTO AS COLUMN0018
FROM
PRDDTA.F4801 F4801
WHERE
WAWR10 = &PlanCenter
AND Date( WASTRX, CYYDDD ) BETWEEN &CompDate AND &CompDate
AND WAANSA = &Planner

GROUP BY
WAWR10,
WAANSA,
WAANPA,
WASTRX,
WADOCO,
WADL01,
WATYPS,
WAPRTS,
WAAMTO,
0 - WAAMTO
```

```
UNION SELECT
WAWR10 AS COLUMN0001,
WAANSA AS COLUMN0002,
WAANPA AS COLUMN0003,
Date( WASTRX, CYYDDD ) AS COLUMN0004,
WADOCO AS COLUMN0005,
WADL01 AS COLUMN0006,
WATYPS AS COLUMN0007,
WAPRTS AS COLUMN0008,
0 AS COLUMN0009,
0 AS COLUMN0010,
0 AS COLUMN0011,
0 AS COLUMN0012,
SUM( WMUORG * WMEA ) AS COLUMN0013,
0 AS COLUMN0014,
0 AS COLUMN0015,
0 AS COLUMN0016,
0 AS COLUMN0017,
0 AS COLUMN0018

FROM
PRDDTA.F4801 F4801,
PRDDTA.F3111LA F3111LA
WHERE
F4801.WADOCO = F3111LA.WMDOCO
AND ( ( WAWR10 = &PlanCenter)
AND Date( WASTRX, CYYDDD ) BETWEEN &CompDate AND &CompDate)
AND WAANSA = &Planner

GROUP BY
WAWR10,
WAANSA,
WAANPA,
WASTRX,
WADOCO,
WADL01,
WATYPS,
WAPRTS
```

```
UNION SELECT
WAWR10 AS COLUMN0001,
WAANSA AS COLUMN0002,
WAANPA AS COLUMN0003,
Date( WASTRX, CYYDDD ) AS COLUMN0004,
WADOCO AS COLUMN0005,
WADL01 AS COLUMN0006,
WATYPS AS COLUMN0007,
WAPRTS AS COLUMN0008,
SUM( WLRUNL ) AS COLUMN0009,
0 AS COLUMN0010,
SUM( WLRUNL * WLPWRT ) AS COLUMN0011,
0 AS COLUMN0012,
0 AS COLUMN0013,
0 AS COLUMN0014,
0 AS COLUMN0015,
0 AS COLUMN0016,
0 AS COLUMN0017,
0 AS COLUMN0018

FROM
PRDDTA.F4801 F4801,
PRDDTA.F3112LA F3112LA
WHERE
F4801.WADOCO = F3112LA.WLDOCO
AND ( ( WAWR10 = &PlanCenter)
AND Date( WASTRX, CYYDDD ) BETWEEN &CompDate AND &CompDate)
AND WAANSA = &Planner

GROUP BY
WAWR10,
WAANSA,
WAANPA,
WASTRX,
WADOCO,
WADL01,
WATYPS,
WAPRTS
```

```
UNION SELECT
WAWR10 AS COLUMN0001,
WAANSA AS COLUMN0002,
WAANPA AS COLUMN0003,
Date( WASTRX, CYYDDD ) AS COLUMN0004,
WADOCO AS COLUMN0005,
WADL01 AS COLUMN0006,
WATYPS AS COLUMN0007,
WAPRTS AS COLUMN0008,
0 AS COLUMN0009,
SUM ( CASE
WHEN GLDCT = 'T4' THEN GLU
END ) AS COLUMN0010,
0 AS COLUMN0011,
SUM ( CASE
WHEN GLDCT = 'T4' THEN GLAA
END ) AS COLUMN0012,
0 AS COLUMN0013,
SUM ( CASE
WHEN GLDCT = 'II' THEN GLAA
END ) AS COLUMN0014,
SUM ( CASE
WHEN GLDCT <> 'T2' AND GLDCT <> 'T4' AND GLDCT <> 'II' THEN GLAA
END ) AS COLUMN0015,
0 AS COLUMN0016,
SUM ( CASE
WHEN GLDCT <> 'T2' THEN GLAA
END ) AS COLUMN0017,
SUM ( CASE
WHEN GLDCT <> 'T2' THEN GLAA
END ) - 0 AS COLUMN0018

FROM
PRDDTA.F4801 F4801,
PRDDTA.F0911LK F0911LK
WHERE
DIGITS( F4801.WADOCO ) = F0911LK.GLSBL
AND ( GLSBLT = 'W'
AND WAWR10 = &PlanCenter
AND Date( WASTRX, CYYDDD ) BETWEEN &CompDate AND &CompDate)
```

AND WAANSA = &Planner

GROUP BY
WAWR10,
WAANSA,
WAANPA,
WASTRX,
WADOCO,
WADL01,
WATYPS,
WAPRTS

Work Order Estimate to Actual Variance (Detail Report Documentation)

Introduction

The Work Order Estimate to Actual Variance Detail report was developed as a means to analyze specific work orders having suspect estimated and/or actual cost. The report utilizes the Showcase Strategy report writer. The BPI Work Execution team provided the criterion used to develop this report.

This report does not represent a comprehensive variance analysis process, but rather a tool used by the process.

Data Source

The report returns column data from the following JD Edwards WorldSoftware production tables:

- **F4801 Work Order Master**
  - WO Number
  - Description
  - Planning Center
  - Completion Date
  - Planner
  - Department
  - Type
  - Priority
  - Estimated Total Cost

- **F3111Work Order Parts List**
  - Estimated Materials Cost
  - Estimated Materials Description

- **F3112 Work Order Routing Instructions**
  - Work Center
  - Operations Sequence
  - Estimated Labour Hours
  - Estimated Labour Cost (Hours * Rate calculation)

- **F0911 General Ledger**
  - Actual Labour Hours (Doc Type = T4)
  - Actual Labour Cost (Doc Type = T4)
  - Actual Materials Cost (Doc Type = II)
  - Actual Other Cost (Doc Type <> T2, T4, or II)
  - Actual Total Cost (Doc Type <> T2)

- **Calculated Report Column**
  - Labour Hour Variance (Actual Labour Hours – Estimated Labour Hours)
  - Labour Cost Variance (Actual Labour Cost – Estimated Labour Cost)
  - Materials Cost Variance (Actual Materials Cost – Estimated Materials Cost)
  - Total Variance (Actual Total Cost – Estimated Total Cost)

Data Sort & Totaling

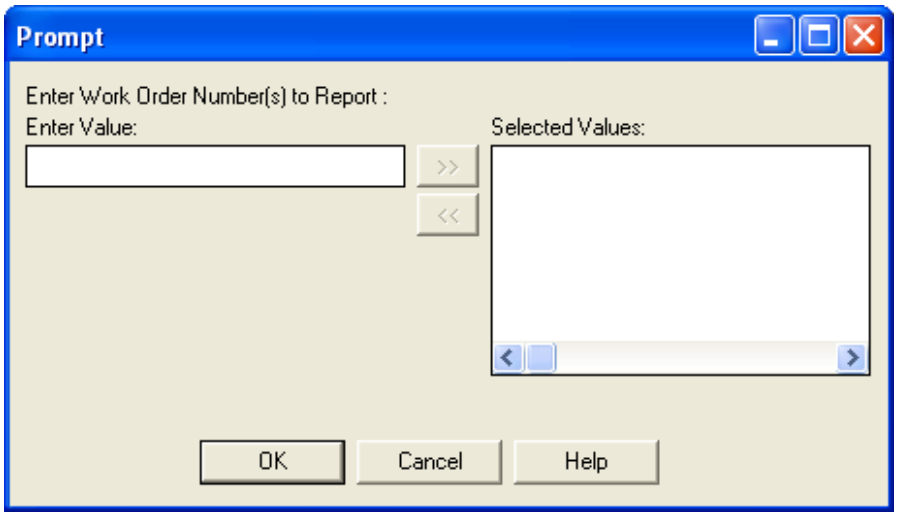
- The report returns records for a specific Work Order or group of Work Orders sorted in ascending order by Work Order number.

  - Note: The SQL statement used by this report differs from that used by standard Showcase Strategy reports. This is due to the nature of the incoming report data, specifically the (many to many) relationship between tables. Therefore, the ability to perform extensive sorting may be limited.

- Data is grouped and totaled by (1) Work Order.

Report Execution

Upon execution the report will prompt the user to supply a value(s) for one condition.



- The prompt requests one or more numeric (Max. 8 digit) value(s) representing the Work Order(s) for which the report is to be executed. This value corresponds with the value contained by the Work Order's master record.

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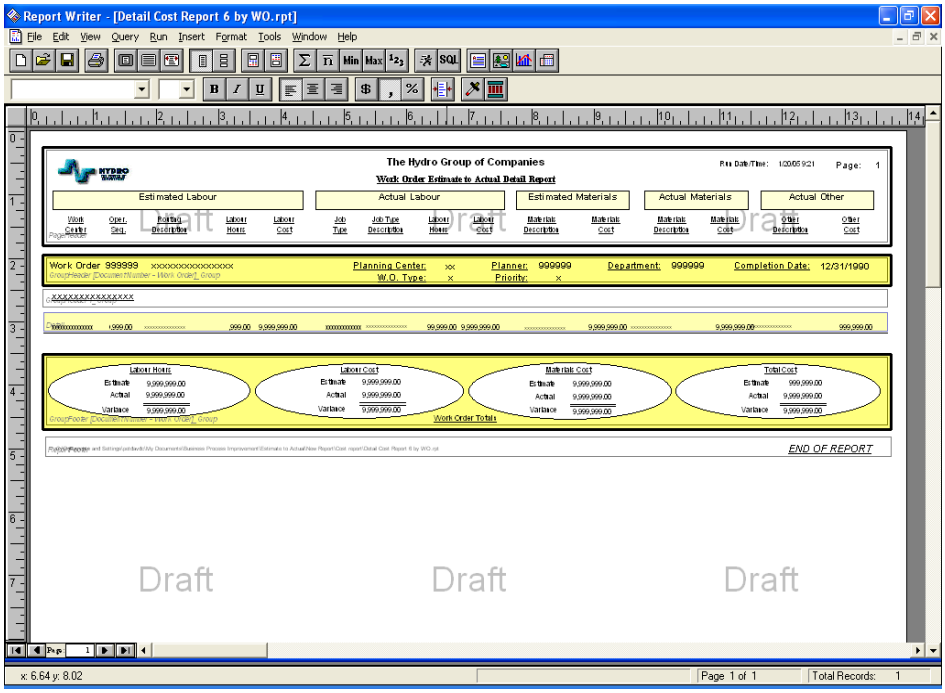
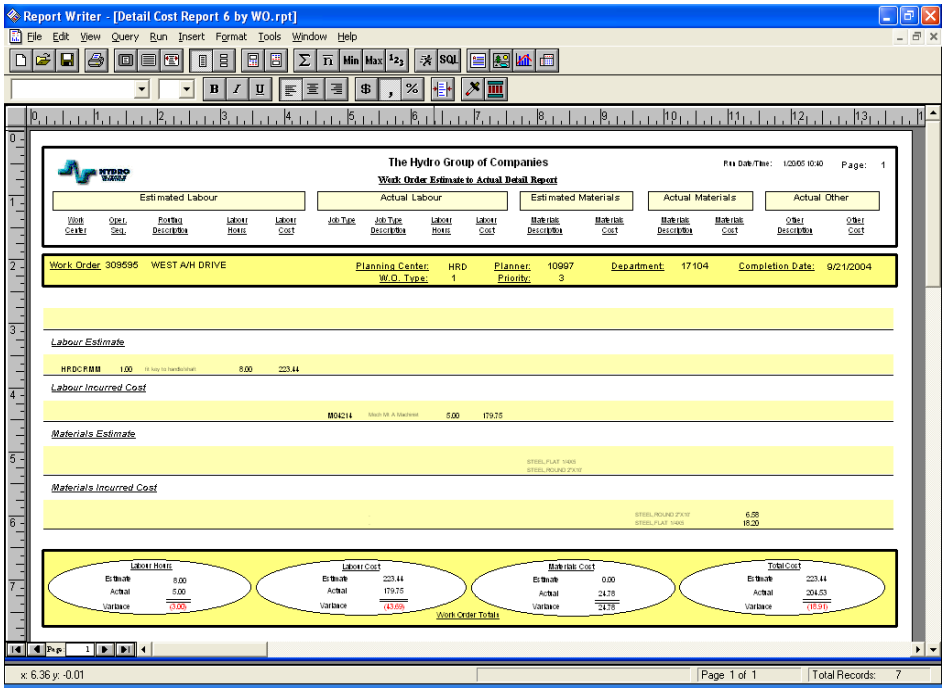
Sample Report Screen Shots





Report Query Select Statement

```
SELECT
WAWR10 AS COLUMN0001,
WAANSA AS COLUMN0002,
WAANPA AS COLUMN0003,
Date( WASTRX, CYYDDD ) AS COLUMN0004,
WADOCO AS COLUMN0005,
WADL01 AS COLUMN0006,
WAAMTO AS COLUMN007,
0 - WAAMTO AS COLUMN0008,
' ' AS COLUMN0009,
' ' AS COLUMN0010,
0 AS COLUMN0011,
0 AS COLUMN0012,
0 AS COLUMN0013,
' ' AS COLUMN0014,
0 AS COLUMN0015,
' ' AS COLUMN0016,
' ' AS COLUMN0017,
' ' AS COLUMN0018,
0 AS COLUMN0019,
0 AS COLUMN0020,
0 AS COLUMN0021,
0 AS COLUMN0022,
0 AS COLUMN0023,
1 AS COLUMN0024,
' ' AS COLUMN0025,
' ' AS COLUMN0026,
0 AS COLUMN0027,
0 AS COLUMN0028,
0 AS COLUMN0029,
WATYPS AS COLUMN0030,
WAPRTS AS COLUMN0031

FROM
PRDDTA.F4801 F4801

WHERE
WADOCO IN (&Wonbr)
```

```
GROUP BY
WAWR10,
WAANSA,
WAANPA,
WASTRX,
WADOCO,
WADL01,
WATYPS,
WAPRTS,
WAAMTO,
0 - WAAMTO

UNION SELECT
WAWR10 AS COLUMN0001,
WAANSA AS COLUMN0002,
WAANPA AS COLUMN0003,
Date( WASTRX, CYYDDD ) AS COLUMN0004,
WADOCO AS COLUMN0005,
WADL01 AS COLUMN0006,
0 AS COLUMN0007,
0 AS COLUMN0008,
WLMCU AS COLUMN0009,
WLDSC1 AS COLUMN0010,
WLOPSQ AS COLUMN0011,
WLRUNL AS COLUMN0012,
WLRUNL * WLPWRT AS COLUMN0013,
' ' AS COLUMN0014,
0 AS COLUMN0015,
' ' AS COLUMN0016,
' ' AS COLUMN0017,
' ' AS COLUMN0018,
0 AS COLUMN0019,
0 AS COLUMN0020,
0 AS COLUMN0021,
0 AS COLUMN0022,
0 AS COLUMN0023,
2 AS COLUMN0024,
'Labour Estimate' AS COLUMN0025,
' ' AS COLUMN0026,
0 - WLRUNL AS COLUMN0027,
```

```
0 - WLRUNL * WLPWRT AS COLUMN0028,
0 AS COLUMN0029,
WATYPS AS COLUMN0030,
WAPRTS AS COLUMN0031

FROM
PRDDTA.F4801 F4801,
PRDDTA.F3112LA F3112LA

WHERE
F4801.WADOCO = F3112LA.WLDOCO
AND WADOCO IN (&Wonbr)

GROUP BY
WAWR10,
WAANSA,
WAANPA,
WASTRX,
WADOCO,
WADL01,
WATYPS,
WAPRTS,
WLMCU,
WLDSC1,
WLOPSQ,
WLRUNL,
WLRUNL * WLPWRT,
0 - WLRUNL,
0 - WLRUNL * WLPWRT

UNION SELECT
WAWR10 AS COLUMN0001,
WAANSA AS COLUMN0002,
WAANPA AS COLUMN0003,
Date( WASTRX, CYYDDD ) AS COLUMN0004,
WADOCO AS COLUMN0005,
WADL01 AS COLUMN0006,
0 AS COLUMN0007,
0 AS COLUMN0008,
' ' AS COLUMN0009,
' ' AS COLUMN0010,
```

```
0 AS COLUMN0011,
0 AS COLUMN0012,
0 AS COLUMN0013,
WMDSC1 AS COLUMN0014,
WMUORG * WMEA AS COLUMN0015,
' ' AS COLUMN0016,
' ' AS COLUMN0017,
' ' AS COLUMN0018,
0 AS COLUMN0019,
0 AS COLUMN0020,
0 AS COLUMN0021,
0 AS COLUMN0022,
0 AS COLUMN0023,
4 AS COLUMN0024,
'Materials Estimate' AS COLUMN0025,
' ' AS COLUMN0026,
0 AS COLUMN0027,
0 AS COLUMN0028,
0 - WMUORG * WMEA AS COLUMN0029,
WATYPS AS COLUMN0030,
WAPRTS AS COLUMN0031

FROM
PRDDTA.F4801 F4801,
PRDDTA.F3111LA F3111LA
WHERE
F4801.WADOCO = F3111LA.WMDOCO
AND WADOCO IN (&Wonbr)

GROUP BY
WAWR10,
WAANSA,
WAANPA,
WASTRX,
WADOCO,
WADL01,
WATYPS,
WAPRTS,
WMDSC1,
WMUORG * WMEA,
0 - WMUORG * WMEA
```

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```
UNION SELECT
WAWR10 AS COLUMN0001,
WAANSA AS COLUMN0002,
WAANPA AS COLUMN0003,
Date( WASTRX, CYYDDD ) AS COLUMN0004,
WADOCO AS COLUMN0005,
WADL01 AS COLUMN0006,
0 AS COLUMN0007,
SUM ( CASE
WHEN GLDCT <> 'T2' THEN GLAA
END ) - 0 AS COLUMN0008,
' ' AS COLUMN0009,
' ' AS COLUMN0010,
0 AS COLUMN0011,
0 AS COLUMN0012,
0 AS COLUMN0013,
' ' AS COLUMN0014,
0 AS COLUMN0015,
GLJBCD AS COLUMN0016,
" GLJBCD01" AS COLUMN0017,
CASE
WHEN GLDCT = 'II'
THEN GLEXR
END AS COLUMN0018,
SUM ( CASE
WHEN GLDCT = 'T4' THEN GLU
END ) AS COLUMN0019,
SUM ( CASE
WHEN GLDCT = 'T4' THEN GLAA
END ) AS COLUMN0020,
SUM ( CASE
WHEN GLDCT = 'II' THEN GLAA
END ) AS COLUMN0021,
SUM ( CASE
WHEN GLDCT <> 'T2' AND GLDCT <> 'T4' AND GLDCT <> 'II' THEN GLAA
END ) AS COLUMN0022,
SUM ( CASE
WHEN GLDCT <> 'T2' THEN GLAA
END ) AS COLUMN0023,
CASE
```

```
WHEN GLDCT = 'T4' THEN 3
WHEN GLDCT = 'II' THEN 5
WHEN GLDCT <> 'T2' AND GLDCT <> 'T4' AND GLDCT <> 'II' THEN 6
END AS COLUMN0024,
CASE
WHEN GLDCT = 'T4' THEN 'Labour Incurred Cost'
WHEN GLDCT = 'II' THEN 'Materials Incurred Cost'
WHEN GLDCT <> 'T2' AND GLDCT <> 'T4' AND GLDCT <> 'II'
THEN 'Other Incurred Cost'
END AS COLUMN0025,
CASE
WHEN GLDCT <> 'T2' AND GLDCT <> 'T4' AND GLDCT <> 'II'
THEN GLEXR
END AS COLUMN0026,
SUM ( CASE
WHEN GLDCT = 'T4' THEN GLU
END ) - 0 AS COLUMN0027,
SUM ( CASE
WHEN GLDCT = 'T4' THEN GLAA
END ) - 0 AS COLUMN0028,
SUM ( CASE
WHEN GLDCT = 'II' THEN GLAA
END ) - 0 AS COLUMN0029,
WATYPS AS COLUMN0030,
WAPRTS AS COLUMN0031

FROM
PRDDTA.F4801 F4801,
PRDDTA.F0911LK F0911LK

WHERE
DIGITS( F4801.WADOCO ) = F0911LK.GLSBL
AND WADOCO IN (&Wonbr)
AND ( GLSBLT = 'W'
AND GLDCT <> 'T2')

GROUP BY
WAWR10,
WAANSA,
WAANPA,
WASTRX,
```

WADOCO,
WADL01,
WATYPS,
WAPRTS,
GLJBCD,
GLEXR,
GLDCT

ORDER BY
5,
24

Work Order Compliance with Estimates

Introduction

This document is intended to provide a functional specification for measuring Work Order Compliance with Estimates The Primary purpose of this Metric is to provide a means to measure how well we execute the our Estimates. The report maximizes Showcase report writer as the tool. The BPI Work Execution Team has in advance provided the criteria to develop this report. The report provides information that can be used to measure estimates of labor cost/hours and estimated material cost versus actual labor cost/hours and actual material cost.

Data Sources

The report returns data from the following tables and columns contained in JD Edwards.

- **F4801 - Work Order Master File**
- **F0618 - Payroll Transaction History File**
- **F3112 – Shop Floor Control Routing Instructions**
  - **Order Type**
  - **Work Order Number**
  - **Parent Work Order**
  - **Type Work Order**
  - **Priority – Work Order**
  - **Description of Work Order**
  - **Company**
  - **Business Unit**
  - **Location**

- **Status of Work Order**
- **Start date**
- **Completion Date**
- **Estimated Hours**
- **Asset Number**
- **Amount – Actual Material**
- **Unit or Tag Number**
- **Supervisor Number**
- **Originator of Work Order**
- **Manager Address Number**
- **Assigned to**
- **Planning Center – Region**
- **Amount Estimated**

Query Properties

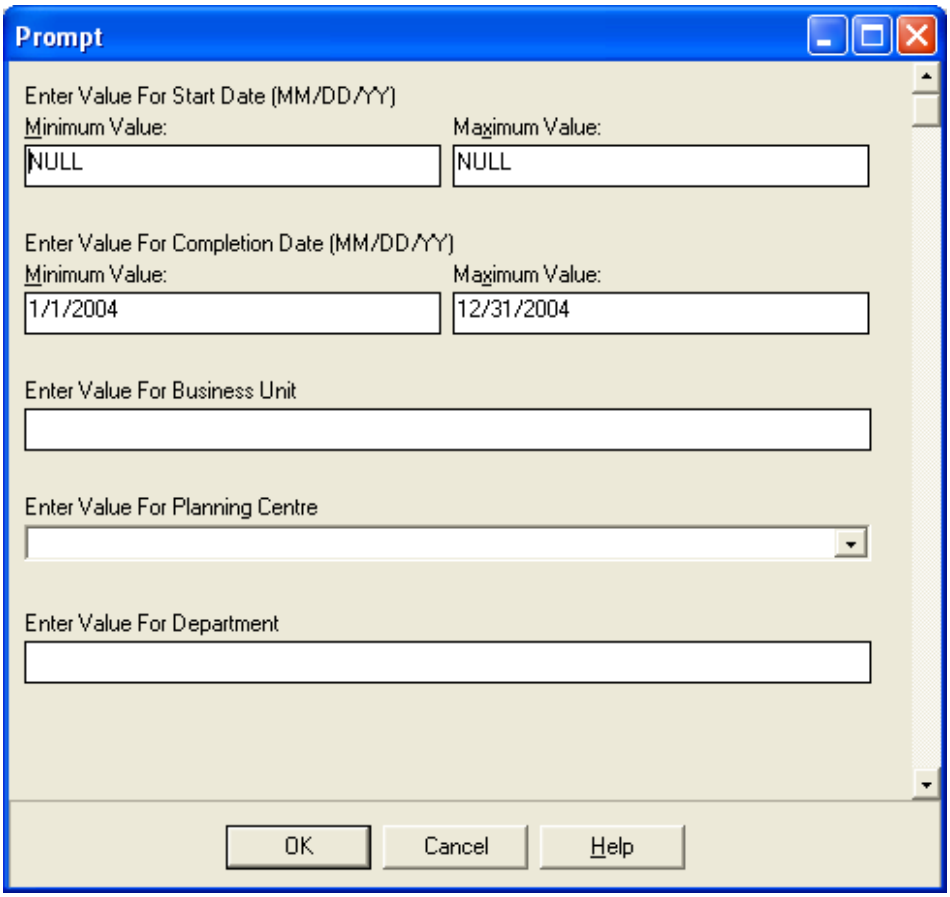
Conditions that are added to this report are as follows:

- ✓ Start date – Prompt
- ✓ Completion date – Prompt
- ✓ Business Unit – Prompt
- ✓ Region – Prompt
- ✓ Department number – Prompt
- ✓ Work Order Type – Prompt

Report Execution

When executing the report you may enter the fields as required:

- ➢ Start date – The last date remains until changed
- ➢ Completion Date - The last date remains until changed
- ➢ Business Unit – Enter a Valid Business Unit
- ➢ Department number – Enter a Valid Department number
- ➢ Work Order Type – Enter a Valid Work Type
- ➢ Planning Center – Either use the pull down menu or type a Valid Region



Select RUN to Execute
This report takes approximately 2 minutes and 30 seconds to run.

The Results are below.

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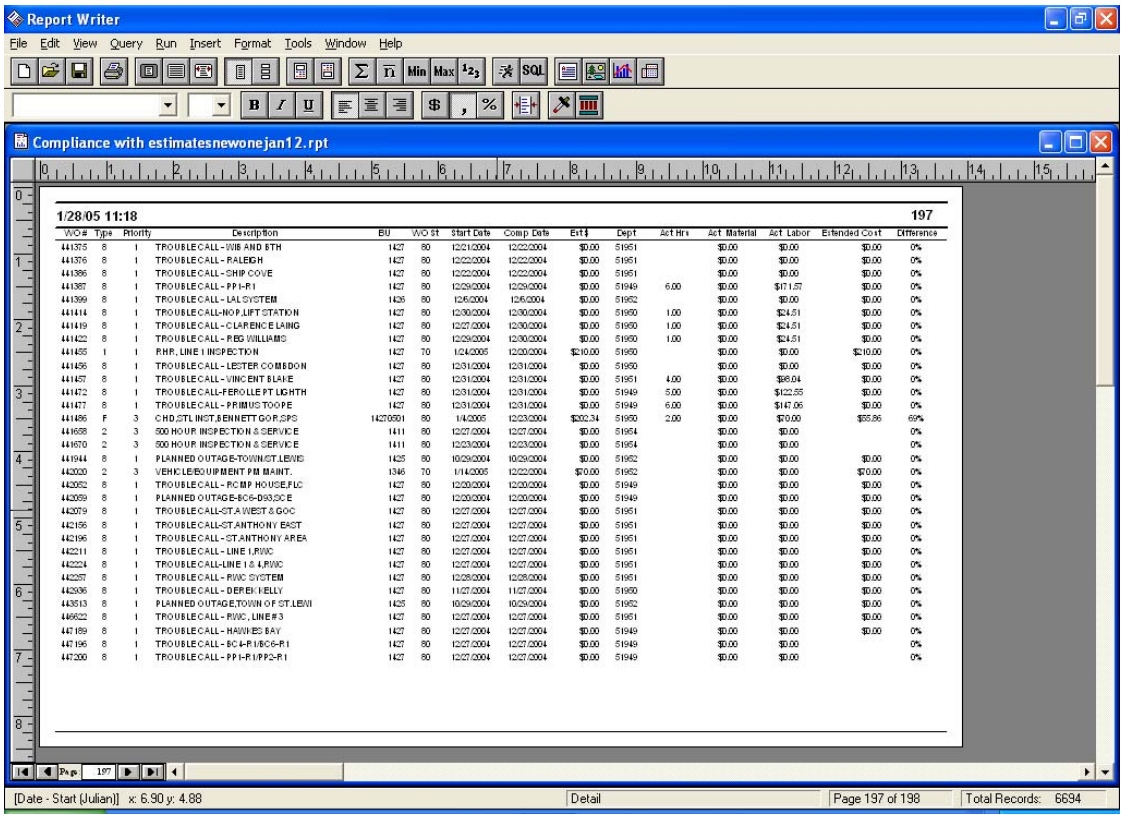


Metric Title: **% Emergency Person Hours Worked**

Metric Background:
Operating in a reactive environment is an obstacle for implementing and using the work execution process. Emergency person hours are all the hours charged to priority #1 work orders. Priority #1 work orders are work orders of high importance and high urgency as outlined in the Routine Work Order Prioritization Guide. This metric provides a clear picture of whether we're operating in a reactive or proactive environment. Spending more than 10% of total person hours on priority work is an indicator that one is in a reactive mode and is normally a symptom of deeper problems.

Metric Definition:
% Emergency Person Hours Worked

$$\frac{\text{Person hours spent on emergency work (priority \#1 wo's)}}{\text{Total Person Hours Worked on all Work Hours}} \times 100$$

Supporting Information:
This metric is generated based on a specified time frame.
Example: January 1, 2005 thru March 31, 2005.

The metric is based on completed work orders (status 70 thru 95)

Prompts must include planning center, business unit, section or dept, start/completion dates.

Frequency of Generation:
This metric must be generated quarterly and at year end.

Note: Ensure metric is generated two weeks after generation date to capture latest timesheet entry data.

Generated by:
The Planning Superintendent, Planning Supervisor or designate.

Target:
Industry average for time worked on priority 1 work orders (emergency work) is 10% or less. Division/Plant sets targets annually as part of goals and objectives.

% Emergency Person Hours Worked

Introduction

Operating in a proactive mode is key for planning and scheduling work. If a major portion of time is spent doing emergency type work, then in all likelihood, planning and scheduling will not be as successful as it should be. Measuring the amount of time spend on emergency work is a good measure to determine the mode of operation (i.e. reactive mode vs. proactive mode). Operating in a reactive mode is usually a symptom of deeper problems.

Emergency hours are a measure of the number of person hours spent doing emergency work as compared to total hours worked. Emergency work is defined as work that must begin now (Priority #1).

Data Sources

The report returns data from the following Tables and Columns contained in JD Edwards:

- **F4801 - Work Order Master File**
- **F0618 - Payroll Transaction History File**
- **F3112 – Shop Floor Control Routing Instructions**
  - **Order Type**
  - **Work Order Number**
  - **Type Work Order**
  - **Priority – Work Order**
  - **Description of Work Order**
  - **Business Unit**
  - **Location**
  - **Status of Work Order**
  - **Address Number**
  - **Supervisor**
  - **Start Date**
  - **Completion date**
  - **Planning Center**
  - **Amount Estimated**
  - **Hours Estimated**
  - **Sum of Hours Worked**
  - **DBA Code**
  - **Amount Actual Labor**

Query Properties

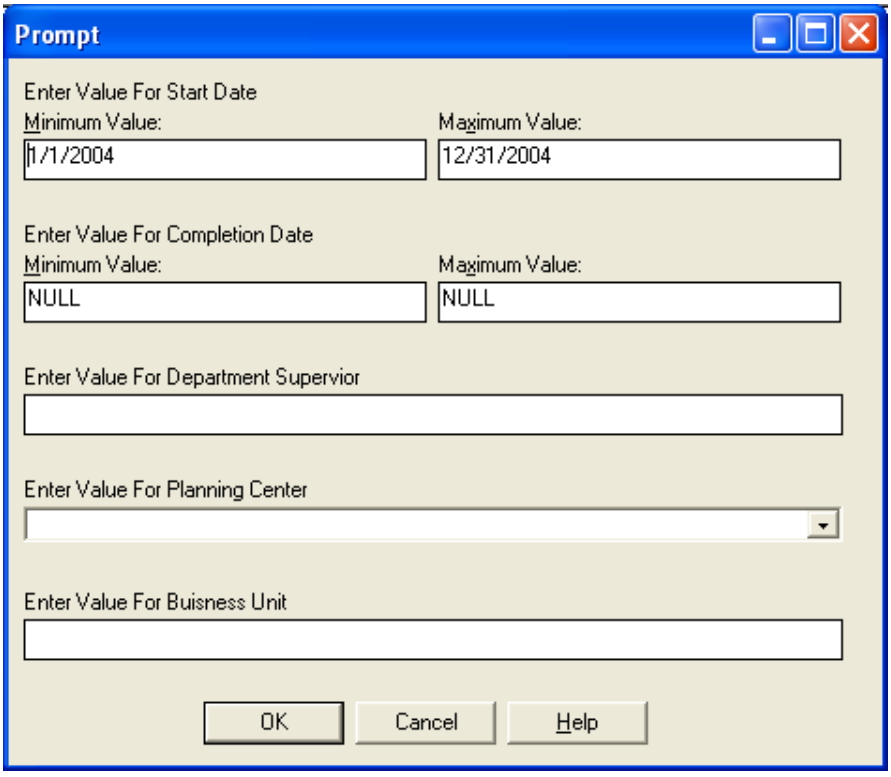
Conditions that are preset are as follows:

DBA Code is less than or equal to 250
Status code is between 10 90

Report Execution

When executing the report you MAY enter the field as required:

- ✓ Start Date
- ✓ Completion Date
- ✓ Department Supervisor
- ✓ Planning Center
- ✓ Business Unit



Once entered you now select Run to Execute

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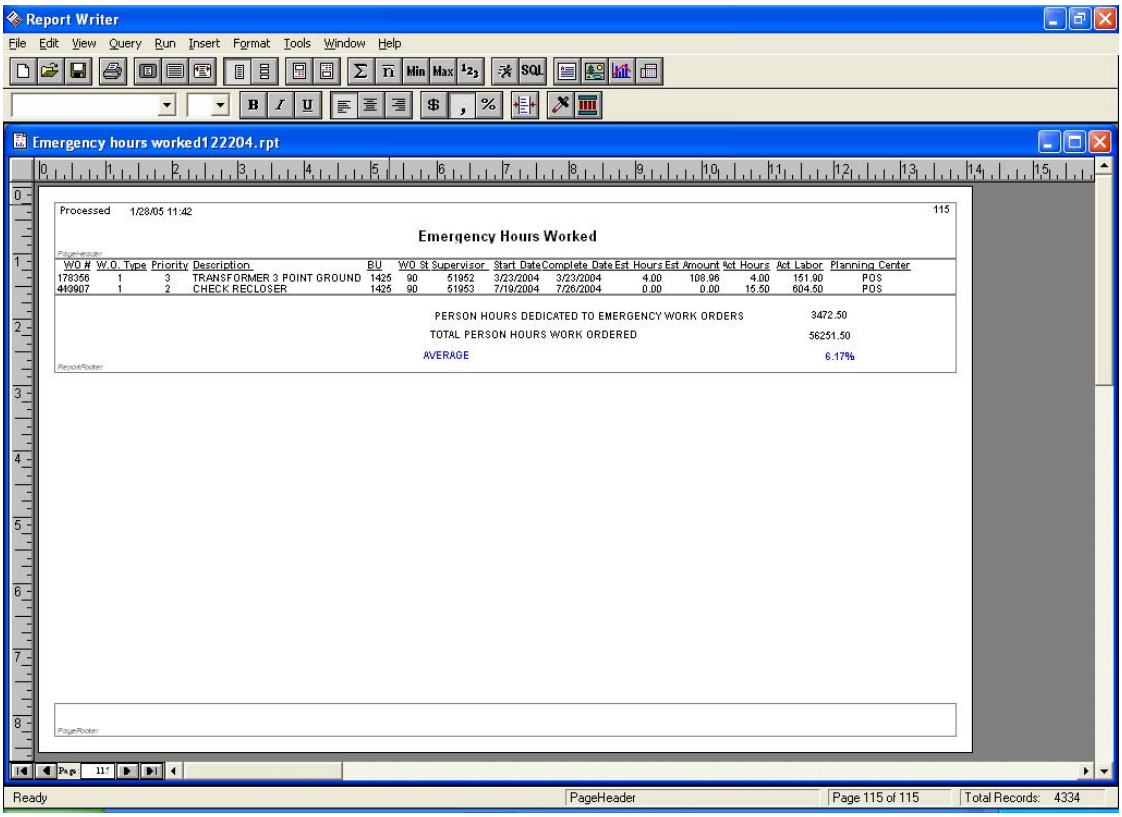

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Metric Title: **% Planned Person Hours Worked**

Metric Background:
Operating in a planned environment is key for the work execution process. Planned person hours are the hours charged to priority #3 and #4 work orders; work orders that should be properly planned and scheduled. Most companies aim to spend 90% plus on planned work. This metric is intended to provide a snapshot of their mode of operation.

Metric Definition:
% Planned Person Hours Worked

$$\frac{\text{Person hours spent planned work (priority \#3 \&\#4 work orders)}}{\text{Total person hours worked on all work hours}} \times 100$$

Supporting Information:

This metric is generated based on a specified time frame.
Example: January 1, 2005 thru March 31, 2005.

The metric is based on completed work orders (status 70 thru 95)

Planned work orders are priority #3 and #4 work orders only..

Prompts must include Planning Center, Business Unit, Section/Dept and start/end dates.

Frequency of Generation:
This metric can be generated on demand but must be generated and documented quarterly and year end.

Note: Generate metric two (2) weeks after generation due date to ensure latest timesheet data is captured.

Generated by:
The Planning Superintendent, Planning Supervisor or designate.

Target:
Industry average for time worked on planned work orders is 90%.

% Planned Person Hours Worked

Introduction

This document is intended to provide a specification for executing a report for measuring the percentage of time spent on planned work (priority #3 and #4) versus unplanned work (priority #1 and #2). The BPI Work Execution Team has in advance provided the criteria to develop this report

Data Sources

The report returns data from the following tables and columns contained in JD Edwards.

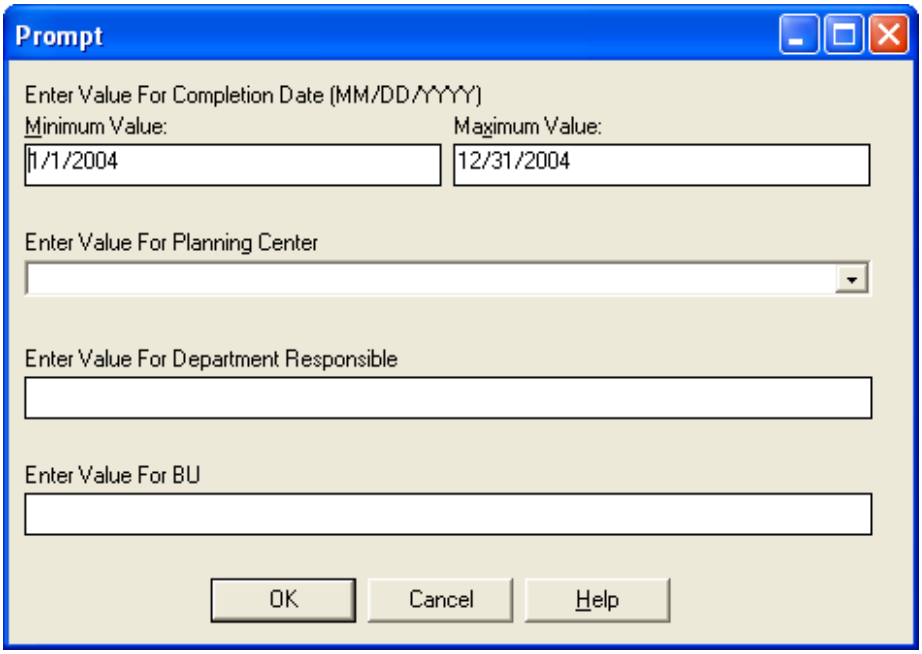
- **F4801 - Work Order Master File**
- **F0618 - Payroll Transaction History File**
  - Address Number
  - Alpha Name
  - Business Unit
  - Sub ledger (Work Order)
  - Description
  - Order Type
  - DBA Code
  - Hours Worked
  - Type of Work Order
  - Priority – Work Order
  - Status of Work Order
  - Supervisor
  - Planning Center
  - Start Date
  - Completion Date
  - Craft

Query Properties

Embedded in the code for this report is the following:

Status of Work order is “IN” 70, 80, and 90
DBA code is less than or equal to 223

Report Execution



1. Enter the Completion date in which to query
2. Enter the Planning Center
3. Enter the Department responsible
4. Enter a Valid Business Unit

Select Run to Execute

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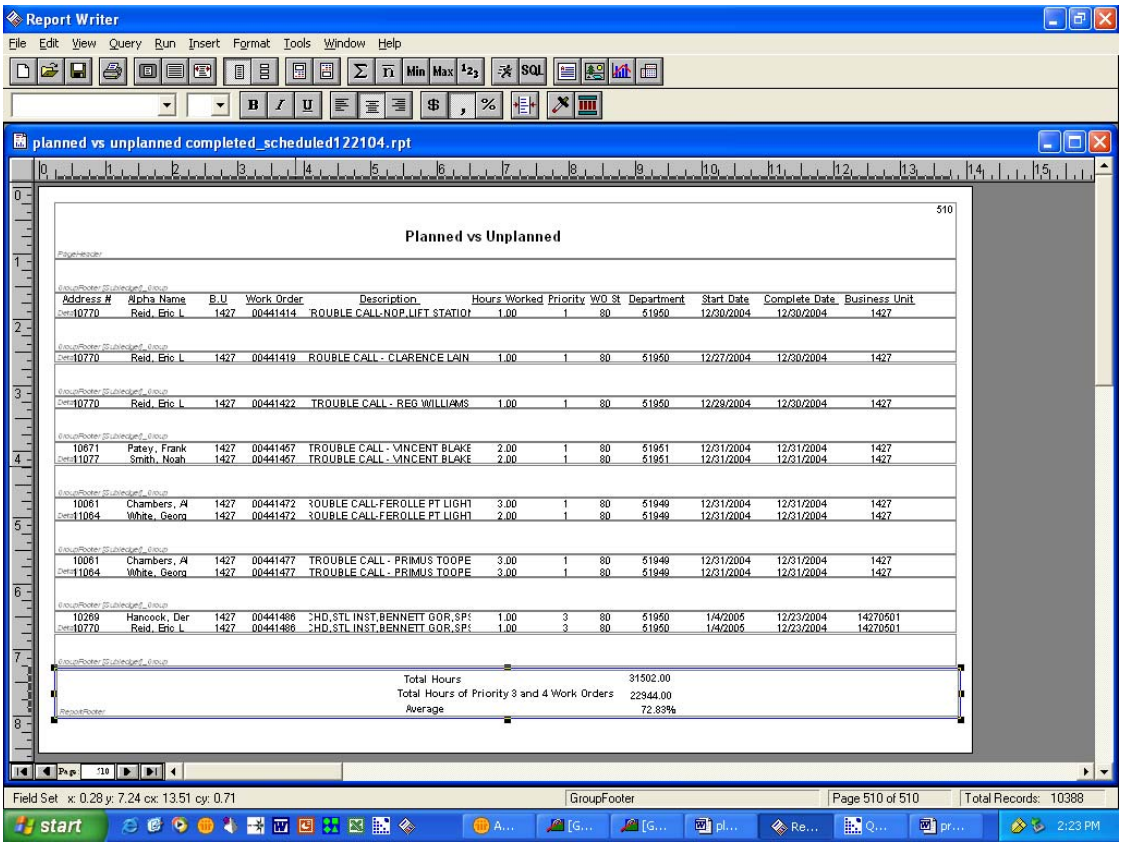

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Metric Title: **% Preventive Maintenance Coverage**

Metric Background:
While correcting equipment failures efficiently and effectively is important, anticipating and heading off failures is also a major part of the maintenance management program. Preventive maintenance concerns itself with keeping equipment from failing in the first place. This should be the principal focus of any work force. As preventive maintenance is such an important part of the maintenance program, it's important to be able to measure the amount of time dedicated to this work so we can properly benchmark against like industries. This metric must not be confused with % pm compliance which actually compares the number of pm inspections to the number completed.

Metric Definition:
% Preventive Maintenance Coverage

$$\frac{\text{Person hours spent on preventive maintenance (type 2) work orders}}{\text{Total person hours worked on all work hours}} \times 100$$

Supporting Information:
This metric is generated based on a specified time frame.
Example: January 1, 2005 thru December 31, 2005.

The metric is based on type 2 completed work orders (status 70 thru 95)

Prompts must include Planning Center, Section/Dept, Craft Code and Start and End Dates.

Frequency of Generation:
This metric can be generated on demand but must be generated and documented annually.

Generation #1Period January 1st thru December 31st

Note: Ensure metric is generated two weeks after generation date to capture latest timesheet entry data.

Generated by:
The Planning Superintendent, Planning Supervisor or designate.

Target:
Industry average is 30% or greater.

Division / Plant target to be determined and set as part of annual goals and objectives.

% Preventative Maintenance Coverage

Introduction

While correcting equipment failures efficiently and effective is important, anticipating and heading off failures is also a major part of the maintenance management program. Preventive maintenance concerns itself with keeping equipment from failing in the first place. This should be the principal focus on any work force. As preventive maintenance is such an important part of the maintenance program, it's important to be able to measure the amount of time dedicated to this work so we can properly benchmark against like industries. This document is intended to provide a functional specification for measuring Preventive Maintenance Coverage. Inputs, interfaces and expected outputs will be identified in this document.

Data Sources

The report returns data from the following Tables and Columns contained in JD Edwards:

- **F4801 - Work Order Master File**
- **F0618 - Payroll Transaction History File**
- **F3112 – Shop Floor Control Routing Instructions**
  - **Order Type**
  - **Work Order Number**
  - **Type Work Order**
  - **Priority – Work Order**
  - **Description of Work Order**
  - **Business Unit**
  - **Location**
  - **Status of Work Order**
  - **Address Number**
  - **Supervisor**
  - **Start Date**
  - **Completion date**
  - **Planning Center**

- **Amount Estimated**
- **Hours Estimated**
- **Sum of Hours Worked**
- **DBA Code**
- **Amount Actual Labor**
- **Craft**

Query Properties

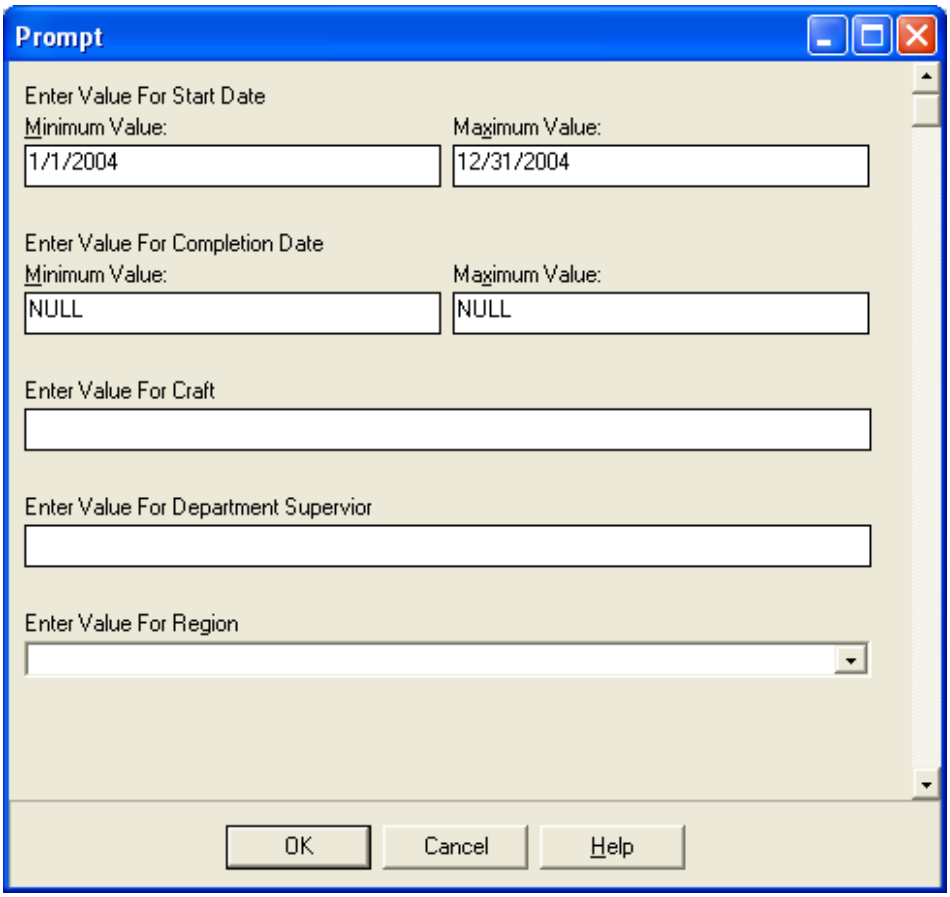
Conditions that are preset are as follows:

DBA Code is less than or equal to 250
Status code is between 10 90

Report Execution

When executing the report you MAY enter the field as required:

- ✓ Start Date
- ✓ Completion Date
- ✓ Craft
- ✓ Department Supervisor
- ✓ Planning Center
- ✓ Business Unit



Once entered you now select Run to Execute

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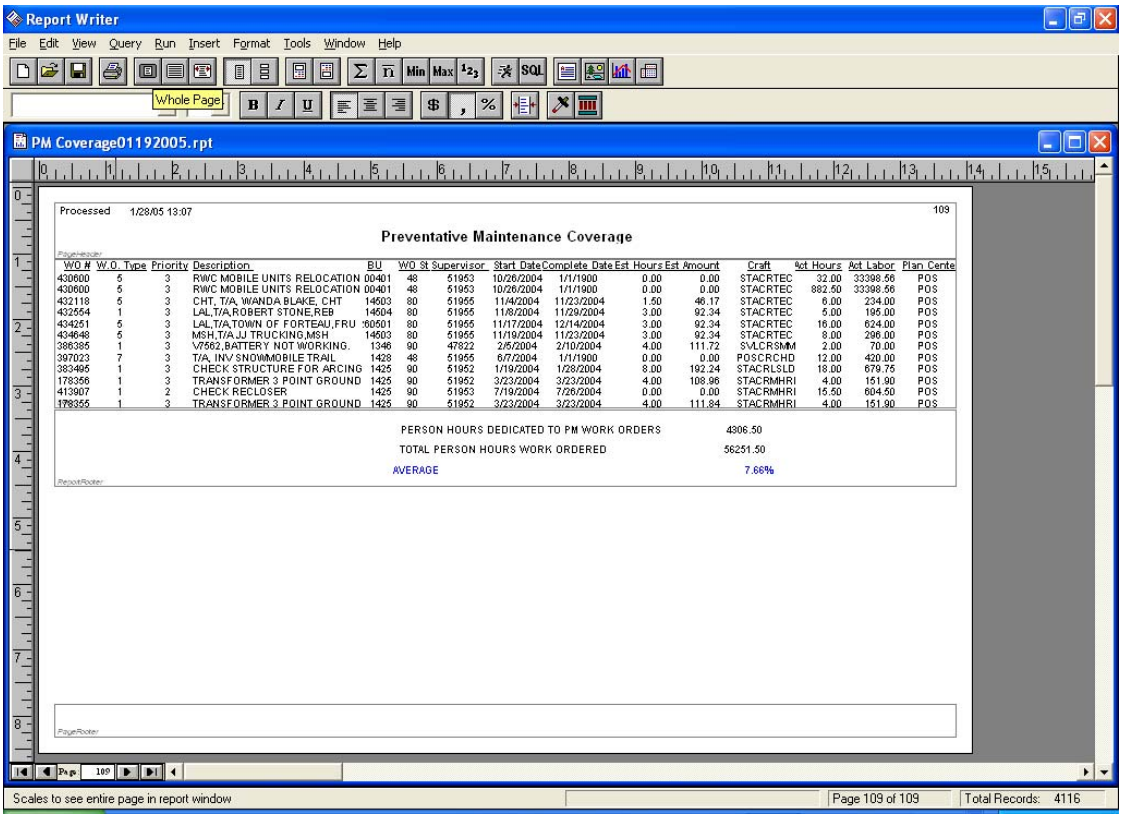

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% Compliance with annual work plan types

- **Preventive Maintenance**
  - **Capital Projects**
  - **Operating Projects**
  - **Non-Maintenance**
    - **Corrective**

Metric Title: **% Preventive Maintenance Compliance**

Metric Background:
Preventive Maintenance is extremely important as it is intended to predict or find failures before they occur. Preventive Maintenance is one of the five-work plan types that is include in the annual work plan. This metric is intended to measure how well we comply with this plan; it actually measures the number of pm inspections completed as compared to the number scheduled.

Metric Definition:
% Preventive Maintenance Compliance

$$\frac{\text{Preventive Maintenance Inspections Completed}}{\text{Preventive Maintenance Inspections Generated for Scheduling}} \times 100$$

Supporting Information:

Preventive maintenance inspections generated for scheduling are all pm work orders at status range 04 thru 91.

Preventive maintenance inspections completed are all pm work orders at status range 70 thru 95 excluding 91. .

Prompts must include planning center, business unit, section or dept, and start/completion dates.

Frequency of Generation:
This metric can be generated on demand but must be generated and documented four times during the year.

Generation #1Period	January 1st thru March 31st
Generation #2 Period	January 1st thru June 30th
Generation #3 Period	January 1st thru October 31st
Generation #4 Period	January 1st thru December 31st

Note: Ensure metric is generated two weeks after generation date to capture latest timesheet entry data.

Generated by:
The Planning Superintendent, Planning Supervisor or designate.

Target:
There is no industry average target available for this metric. Divisions/Plants will have to establish their own targets as part of their annual goals and objectives.

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Metric Title: **% of Capital Projects Completed**

Metric Background:
The purpose of this metric is to measure the number of capital projects completed within a specified time frame as compared to the number scheduled.

Metric Definition:
% Capital Projects Completed.

Capital Project Work Orders Completed x 100
Capital Project Work Orders Scheduled

Supporting Information:
This metric is generated based on a specified time frame.
Example: January 1, 2005 thru December 31, 2005.

Capital Project Work Orders scheduled = 5%

The metric is based on completed capital project work orders (type 5) at status 70 thru 90.

Prompts must include planning center, business unit, section or dept, start/completion dates.

Frequency of Generation:
This metric can be generated on demand but must be generated annually.

Note: Ensure metric is generated two weeks after generation date to capture latest timesheet entry data.

Generated by:
The Planning Superintendent, Planning Supervisor or designate.

Target:
Plant Division will set Targets.

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Metric Title: **% of Operating Projects Completed**

Metric Background:
The purpose of this metric is to measure the number of projects completed within a specified time frame as compared to the number scheduled.

Metric Definition:
% Operating Projects Completed.

Operating Project Work Orders Completed) x 100
Operating Project Work Orders Scheduled.

Supporting Information:
This metric is generated based on a specified time frame.
Example: January 1, 2005 thru March 31, 2005.

Operating Projects Scheduled = 4%

The metric is based on completed project work orders (type 4) at status 70 thru 90.

Prompts must include planning center, business unit, section or dept, start/completion dates.

Frequency of Generation:
This metric can be generated on demand but must be generated annually.

Note: Ensure metric is generated two weeks after generation date to capture latest timesheet entry data.

Generated by:
The Planning Superintendent, Planning Supervisor or designate.

Target:
Industry average for time worked on priority 1 work orders (emergency work) is 10% or less.

Division/Plant sets targets annually as part of goals and objectives.

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Metric Title: **% of Non-Maintenance Work Orders Completed**

Metric Background:
The purpose of this metric is to measure the number of non –maintenance work orders completed within a specified time frame as compared to the number scheduled in the annual work plan.

Metric Definition:
% Non-Maintenance Work Orders Completed

$$\frac{\text{Non-Maintenance Work Orders Completed}}{\text{Non-Maintenance Work Orders Scheduled}} \times 100$$

Supporting Information:
This metric is generated based on a specified time frame.
Example: January 1, 2005 thru December 31, 2005.

The metric is based on completed non-maintenance work orders (type 3) at status 70 thru 90.

Prompts must include planning center, business unit, section or dept, start/completion dates.

Frequency of Generation:
This metric can be generated on demand but must be generated and documented annually.

Note: Ensure metric is generated two weeks after generation date to capture latest timesheet entry data.

Generated by:
The Planning Superintendent, Planning Supervisor or designate.

Target:
Plant/Division will set Targets.

Compliance to Annual Work Plans

Introduction

Definition
Compliance to work plan types is a measure of the work plan type packages that come from WI&P and Work Budgets. These packages are corrective maintenance, preventative maintenance, non-maintenance, operating and capital projects.

Background
Work plan types are new to the Hydro Group and measuring how well we did with respect to these plans will provide an indication of where improvements can be made. Presently we budget and in most cases balanced our budgets but did we follow our work plan and hence achieve the justified strategic goals of the section, department and Company? Approved work plan types including budget will be provided for each Business Unit through the Work Identification and Prioritization and Work Budgets processes. Through the work execution process we aim to complete these plans on time at least cost while maintaining quality.

Scope
This document is intended to provide functional specification for measuring compliance to the work plan types.

Purpose
The primary purpose of the work plan type metric is to provide a means to measure how well we executed the work plan type packages.

Overview
Presently there are no work plan type packages from WI&P, this will be a new measure to see how the process is working.

Key Characteristics

There are several characteristics that the systems for measuring work plan types.

- The system must have flexible querying
- The system must be fast, flexible and easy to use.
- The system must be seamless, in that the user should not have to perform multiple functions to obtain the required information from JD Edwards.

Metric Specification

Evaluation of work Plans (PM,CM,OP,CP,NM)

Evaluation of Preventative Maintenance Work Plan

a. % = PM Inspections Completed x 100
PM Inspections Scheduled

b. Pm Budget Performance = Original Budget – Actual Budget x 100
Original Budget

Evaluation of Operating Projects Work Plan

a. % = Operating Projects Completed x 100
Operating Projects Scheduled

b. Operating Projects Budget Performance = Original Budget – Actual Budget x 100
Original Budget

Evaluation of Capital Projects Work Plan

a. % = Capital Projects Completed x 100
Capital Projects Scheduled

b. Capital Projects Budget Performance = Original Budget – Actual Budget x 100
Original Budget

Evaluation of Corrective Maintenance Work Plan

a. CM Budget Performance = Original Budget – Actual Budget x 100
Original Budget

Evaluation of NM Work Plan

a. % = Non Maintenance Work Completed x 100
Non-Maintenance Work Scheduled

b. Non Maintenance Budget Performance = Original Budget – Actual Budget x 100
Original Budget

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Procedures

For Capital Projects, Non Maintenance Work Completed, PM Inspections Completed, and Operating Projects.

When inquiring on **Capital Projects**, you need to do the following:

- Enter a valid Business Unit I.E 13503
- Enter a Start Date 01/01/2003 – 12/31/2003 (This date will remain there until changed)
- Enter a Completion Date. If left blank **NULL** will appear, this reminds you that the last time you or someone else ran the report it was **NOT** used
- You now can enter a specific Asset number or leave blank to retrieve all. **This example does not have an Asset number entered**
- Enter a Planning Center. This is the Region that you are inquiring on. You can click on the arrow to see the list or type the appropriate 3-letter code for your Region. I.E. POS
- Select RUN to execute

When inquiring on **Non Maintenance Work completed**, you need to do the following:

- Enter a valid Business Unit I.E 1427
- Enter a Start Date 01/01/2004 – 12/31/2004 (This date will remain there until changed)
- Enter a Completion Date. If left blank **NULL** will appear, this reminds you that the last time you or someone else ran the report it was **NOT** used
- You now can enter a specific Asset number or leave blank to retrieve all. **This example does not have an Asset number entered**
- Enter a Planning Center. This is the Region that you are inquiring on. You can click on the arrow to see the list or type the appropriate 3-letter code for your Region. I.E. POS
- Select RUN to execute

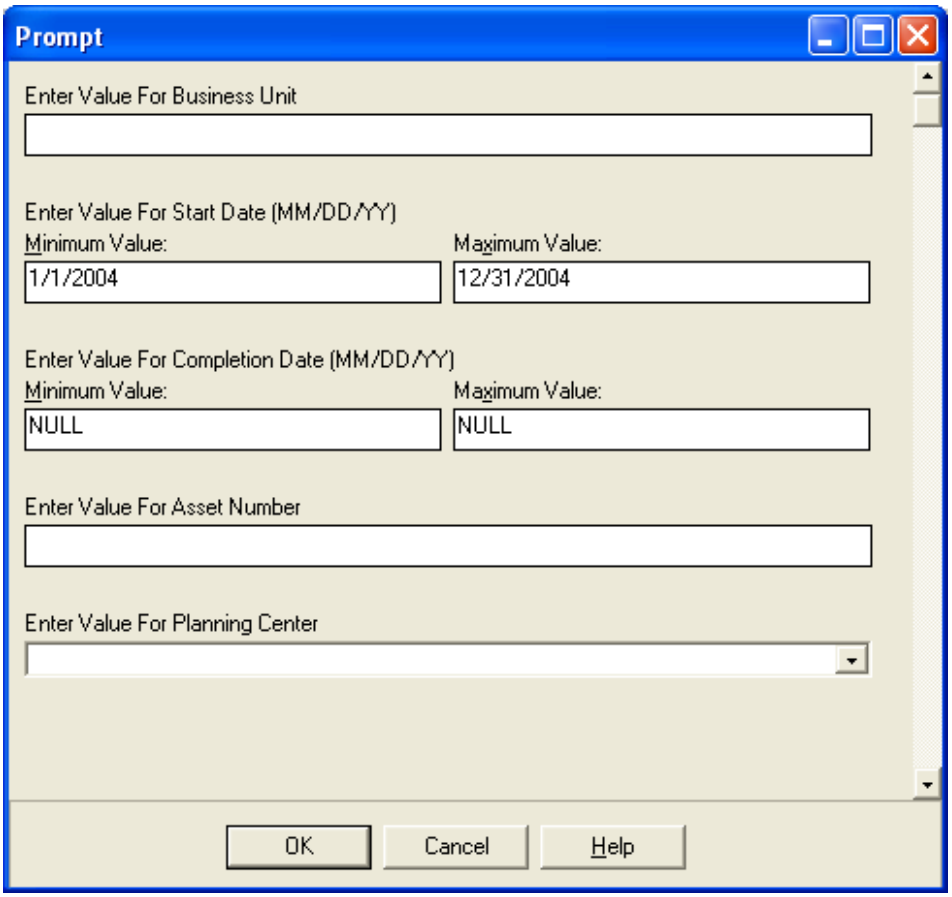
When inquiring on **PM Inspections Completed**, you need to do the following:

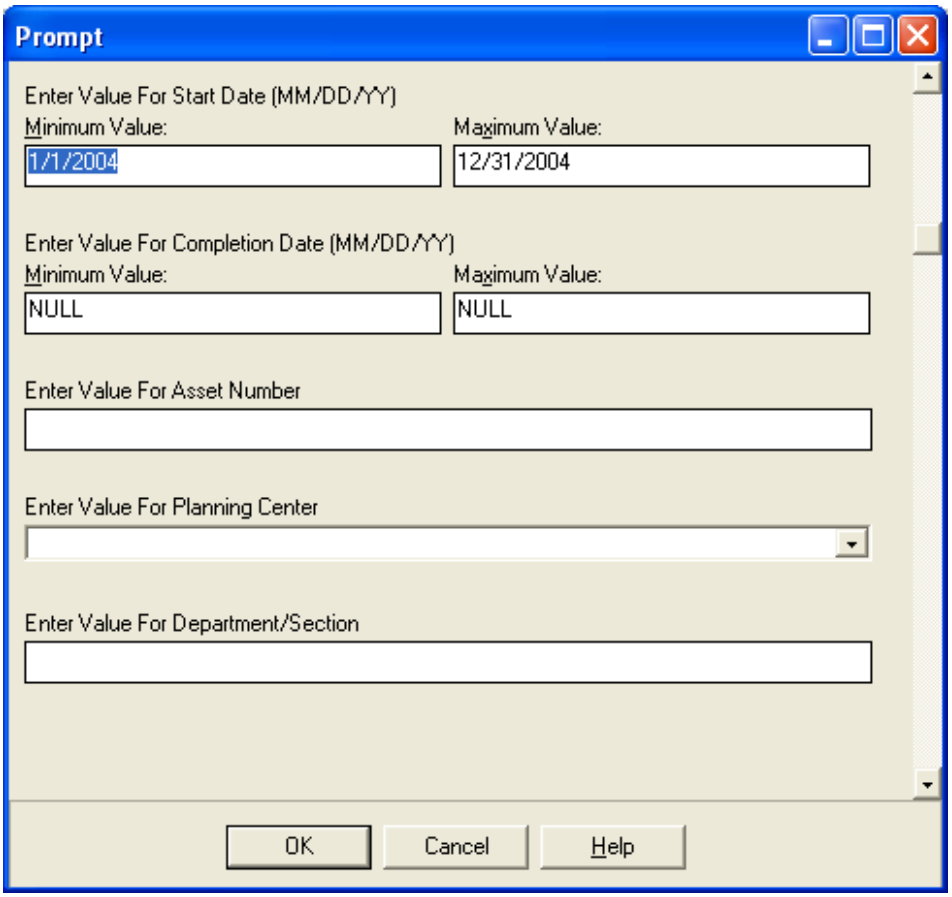
- Enter a valid Business Unit I.E 1391
- Enter a Start Date 01/01/2003 – 12/31/2003 (This date will remain there until changed)
- Enter a Completion Date. If left blank **NULL** will appear, this reminds you that the last time you or someone else ran the report it was **NOT** used

- You now can enter a specific Asset number or leave blank to retrieve all. **This example does not have an Asset number entered**
- Enter a Planning Center. This is the Region that you are inquiring on. You can click on the arrow to see the list or type the appropriate 3-letter code for your Region. I.E. HVY
- Select RUN to execute

When inquiring on **Operating Projects Completed**, you need to do the following:

- Enter a valid Business Unit I.E 1295
- Enter a Start Date 01/01/2003 – 12/31/2003 (This date will remain there until changed)
- Enter a Completion Date. If left blank **NULL** will appear, this reminds you that the last time you or someone else ran the report it was **NOT** used
- You now can enter a specific Asset number or leave blank to retrieve all. **This example does not have an Asset number entered**
- Enter a Planning Center. This is the Region that you are inquiring on. You can click on the arrow to see the list or type the appropriate 3-letter code for your Region. I.E. BDE
- Select RUN to execute


Prompt
Enter Value For Business Unit
Enter Value For Start Date (MM/DD/YY)
Minimum Value:
Maximum Value:
1/1/2004
12/31/2004
Enter Value For Completion Date (MM/DD/YY)
Minimum Value:
Maximum Value:
NULL
NULL
Enter Value For Asset Number
Enter Value For Planning Center
OK
Cancel
Help



The results are listed below.

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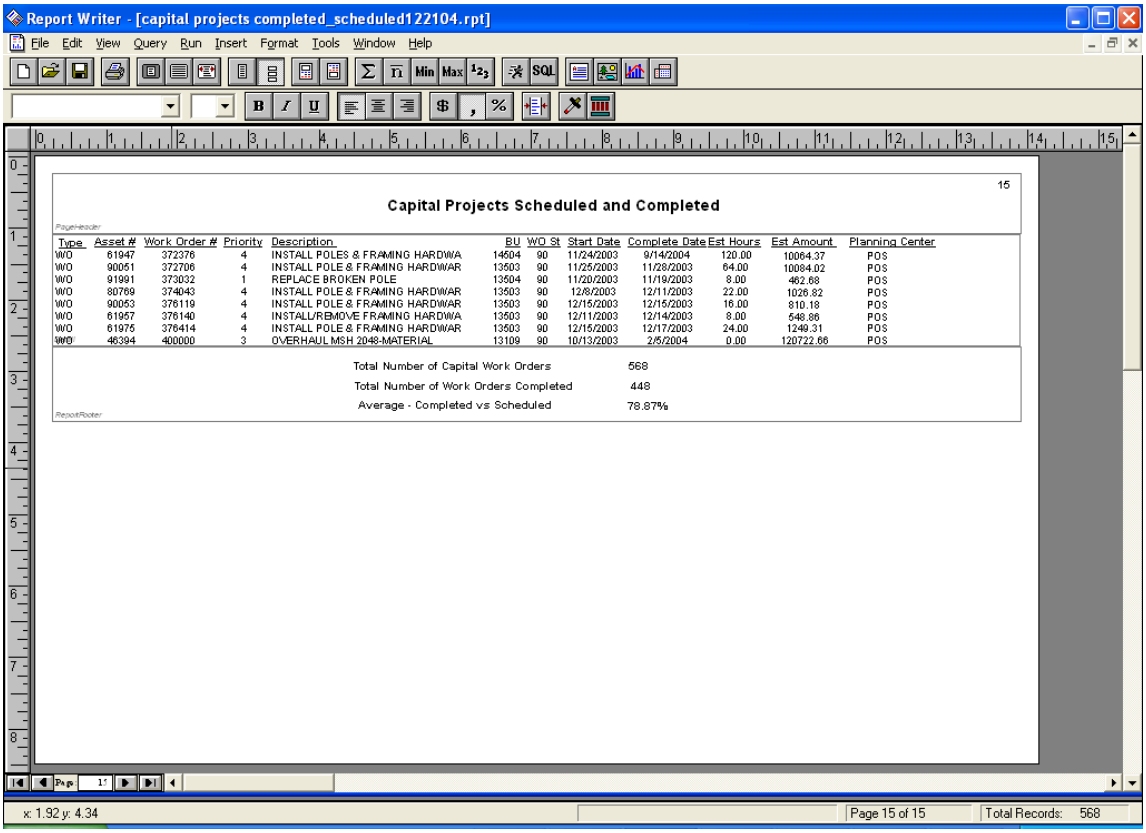
Capital Projects



Newfoundland & Labrador Hydro
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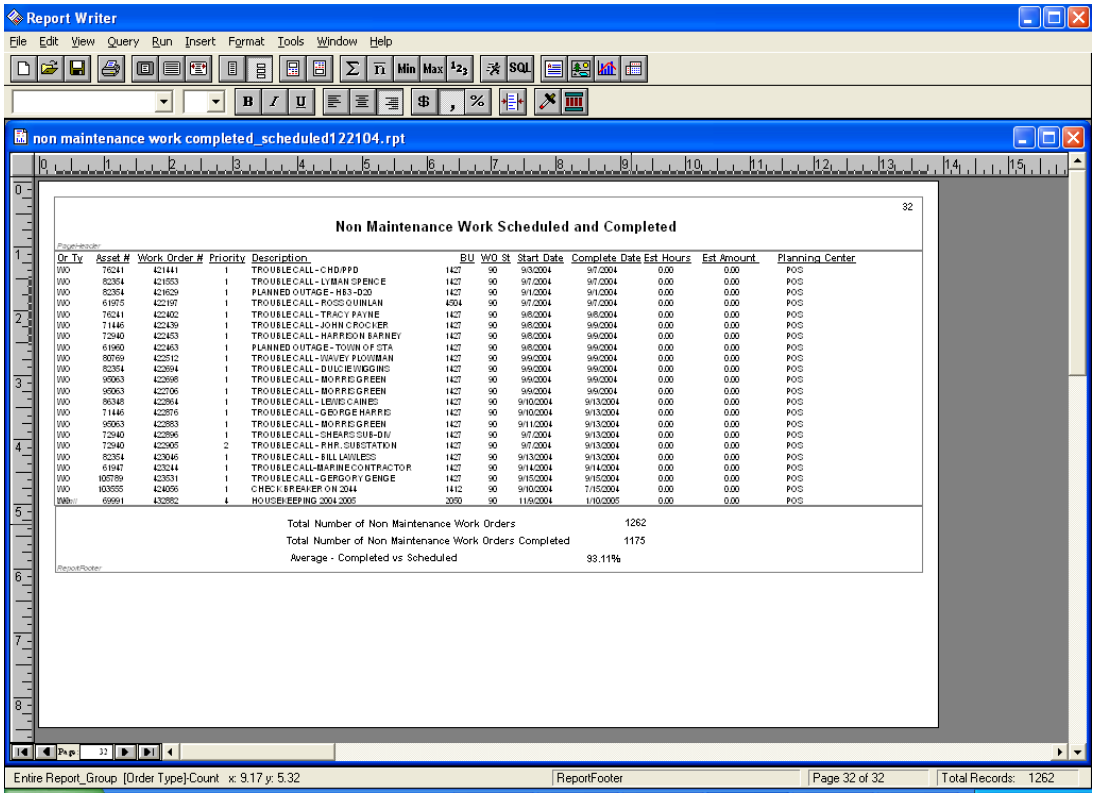
Non-Maintenance Work



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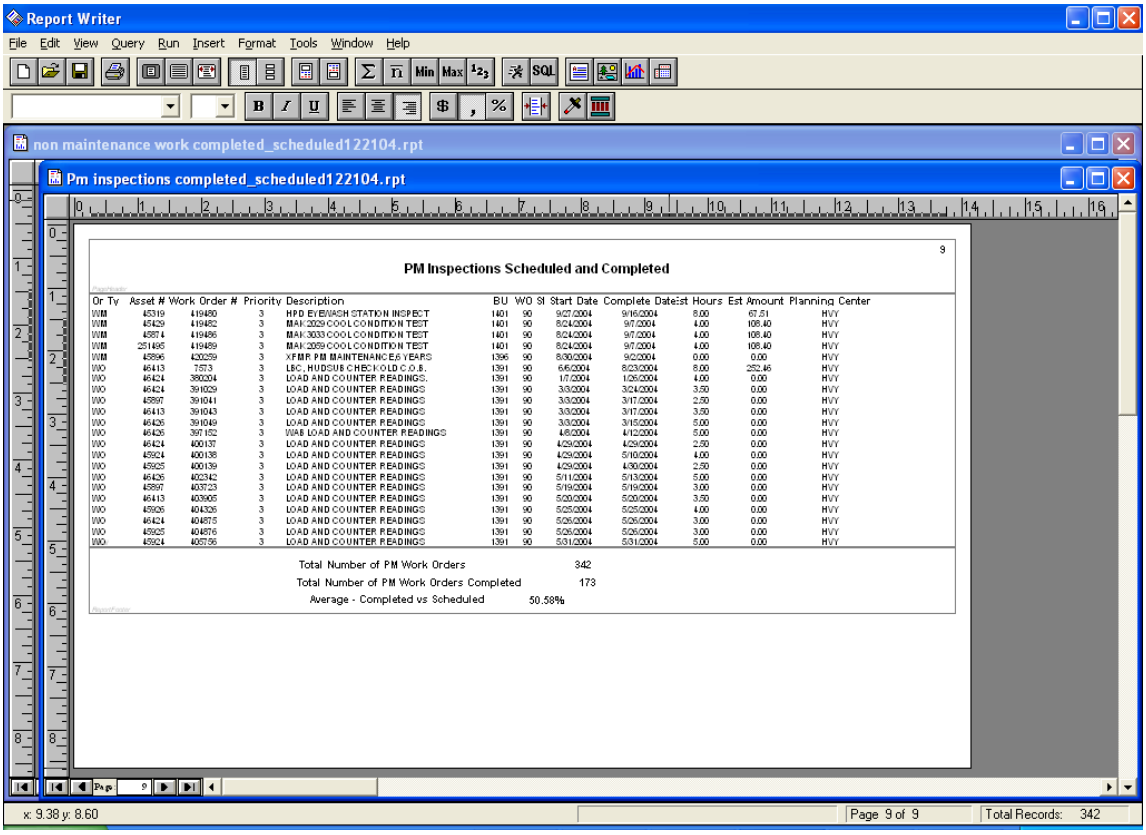
PM Inspections



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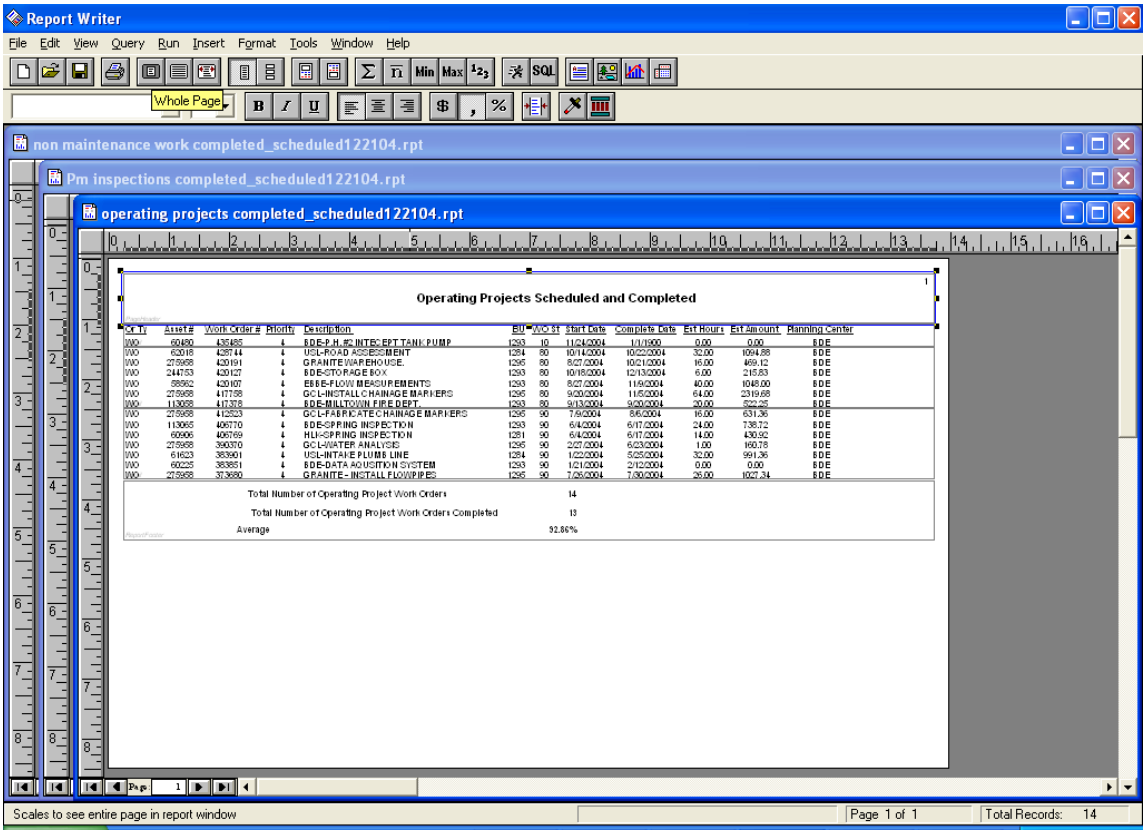
Operating Projects Completed



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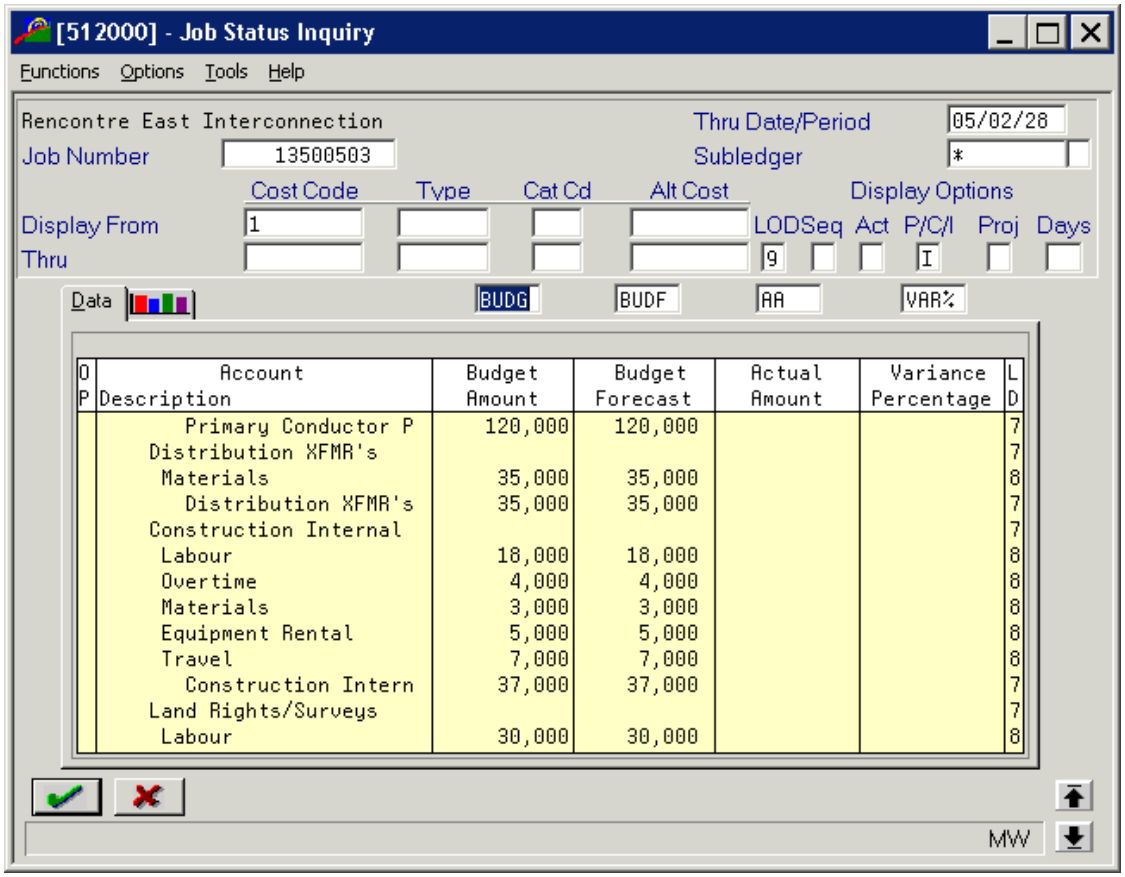
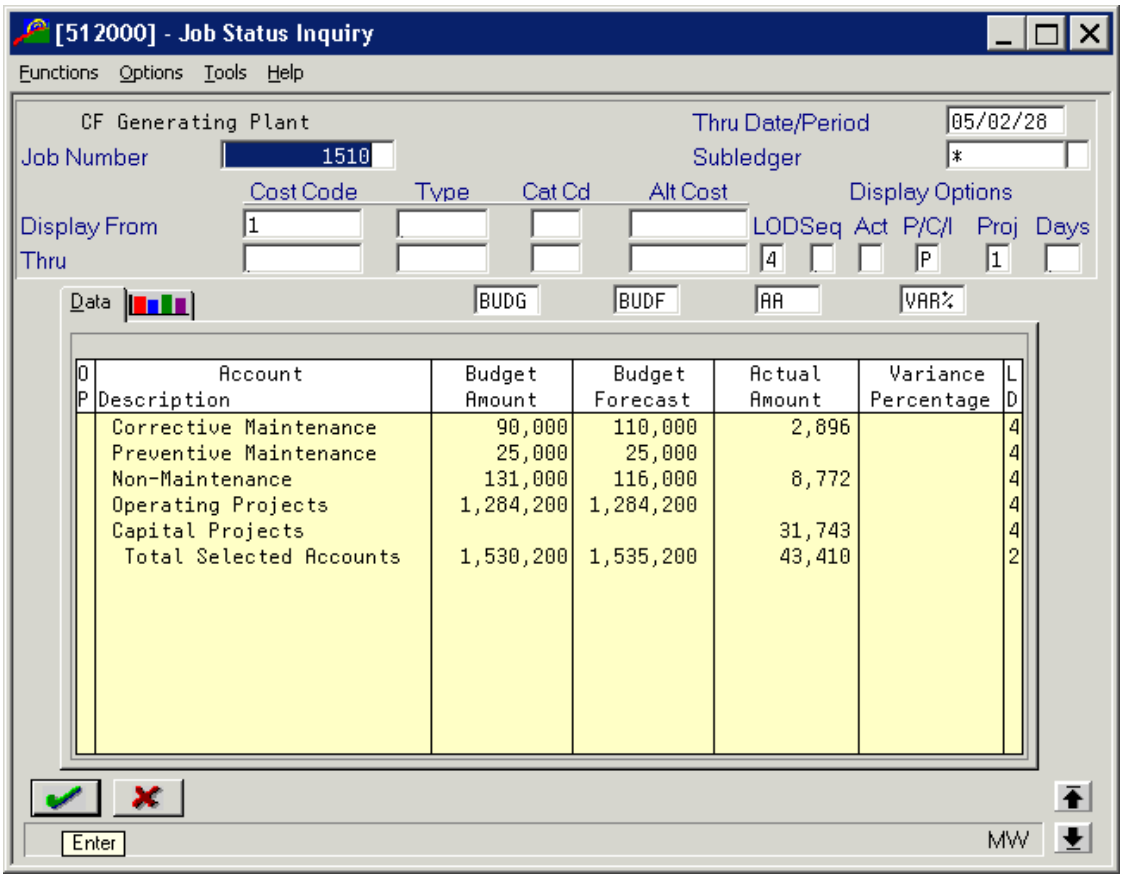
Metric Title: **Compliance to Work Plan Type Budgets**

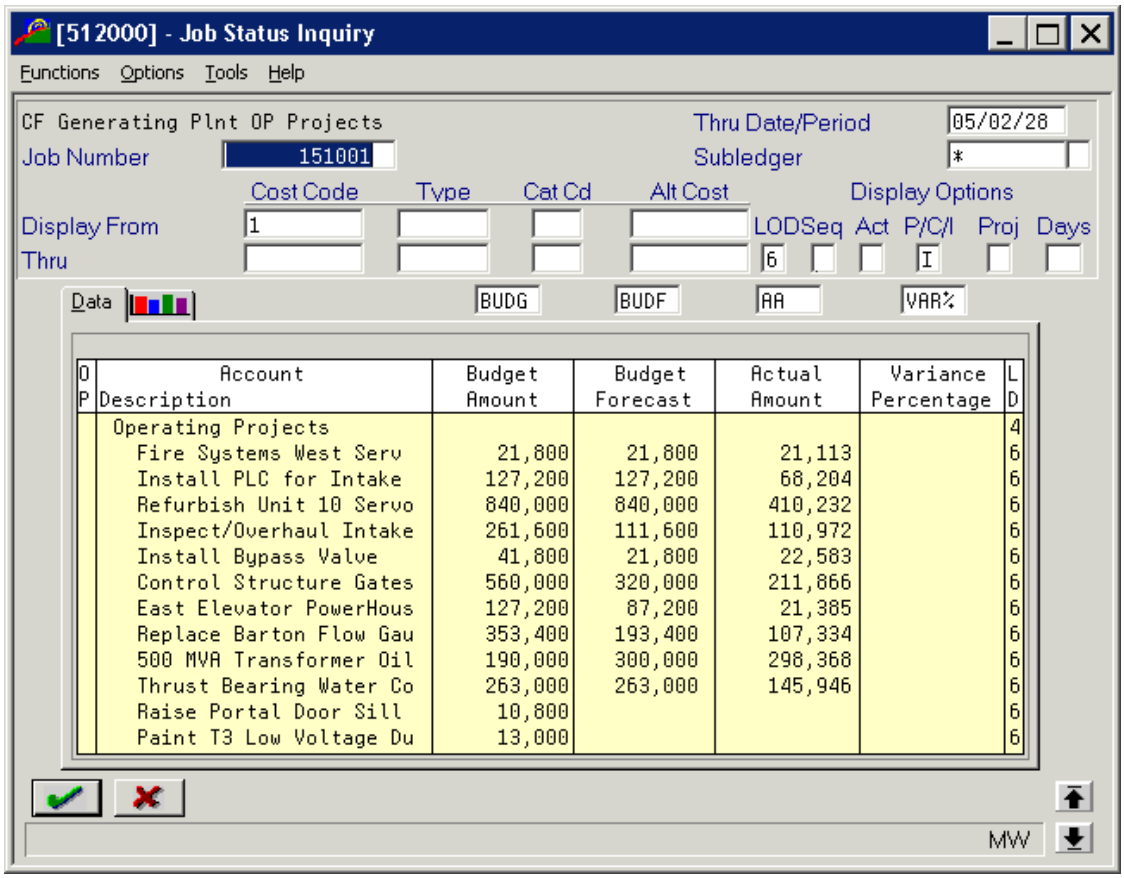
Metric Background:
There are five (5) basic work plan types i.e. corrective, preventive, non-maintenance, operating and capital projects. Each one of these work plan types has a budget set up under their respective business units. Some of these work plan types have program budgets i.e. corrective while others like operating and capital projects have individual budgets. The intent of this metric is to measure compliance with budgets.

Metric Definition:
The information for this metric will be obtained live by the Project Manager or Asset/ Business Unit Manager using the **Job Status Inquiry Screen (512000) in** JDEdwards.

Supporting Information:




[512000] - Job Status Inquiry
Functions Options Tools Help
CF Generating Plant
Thru Date/Period 05/02/28
Job Number 1510
Subledger *
Cost Code Type Cat Cd Alt Cost Display Options
Display From 1
Thru
LODSeq Act P/C/I Proj Days
4 P 1
Data
BUDG BUDF AA VAR%
OP Account Description
Budget Amount
Budget Forecast
Actual Amount
Variance Percentage
LD
Corrective Maintenance 90,000 110,000 2,896 4
Preventive Maintenance 25,000 25,000 4
Non-Maintenance 131,000 116,000 8,772 4
Operating Projects 1,284,200 1,284,200 4
Capital Projects 31,743 4
Total Selected Accounts 1,530,200 1,535,200 43,410 2
Enter
MW



Frequency of Generation:

Operating Projects	**Generate and document at end of each individual project** but recommend generating as often as necessary to manage budget during construction.
Capital Projects:	**Generate and document at end of each individual project** but recommend generating as often as necessary to manage budget during construction.
Non- Maintenance	**Generate at year-end** but recommend generating as often as required to manage budget during year. (Monthly, quarterly, etc.)

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Corrective Maintenance	**Generate at year end** but recommend generating as often as required to manage budget during year. (Monthly, quarterly, etc.)
Preventive Maintenance	**Generate at year-end** but recommend generating as often as required to manage budget during year. (Monthly, quarterly, etc.)
Generated by:	Project Manager for Capital and Operating Projects. Asset/Business Unit Manager for Corrective, Preventive and Non Maintenance Budgets.
Target:	To be established by Division/Plant as part of goals and objectives.

Percentage Replanned Work Orders

Introduction

This document is intended to provide a functional specification for measuring replanned work. The primary purpose of this metric is to provide a means, with little effort, to measure replanned work orders by extracting the information from JD Edwards.

Data Sources

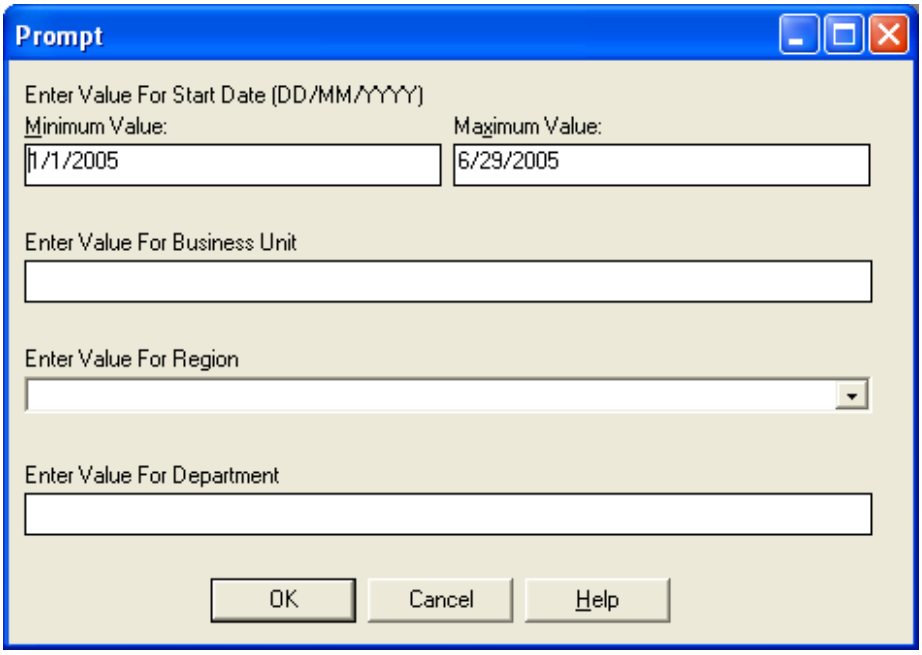
This report returns data from the following table(s) and Column(s) contained in JD Edwards

- **F4801**
  - Work Order Number
  - Business Unit
  - Start Date
  - Description
  - Planning Center
  - Department (Supervisor)
  - Status Code (Work Order)
  - Phase Code (REP)

Query Properties

A predefine “REP” for Reschedules Work is embedded in the conditions of the report

Report Execution



1. Enter a valid Start Date (the last date will remain until changed)
2. Enter A Valid Business unit
3. Enter valid Region (you can select the pull down)
4. Enter a valid Department Number

Select RUN to Execute

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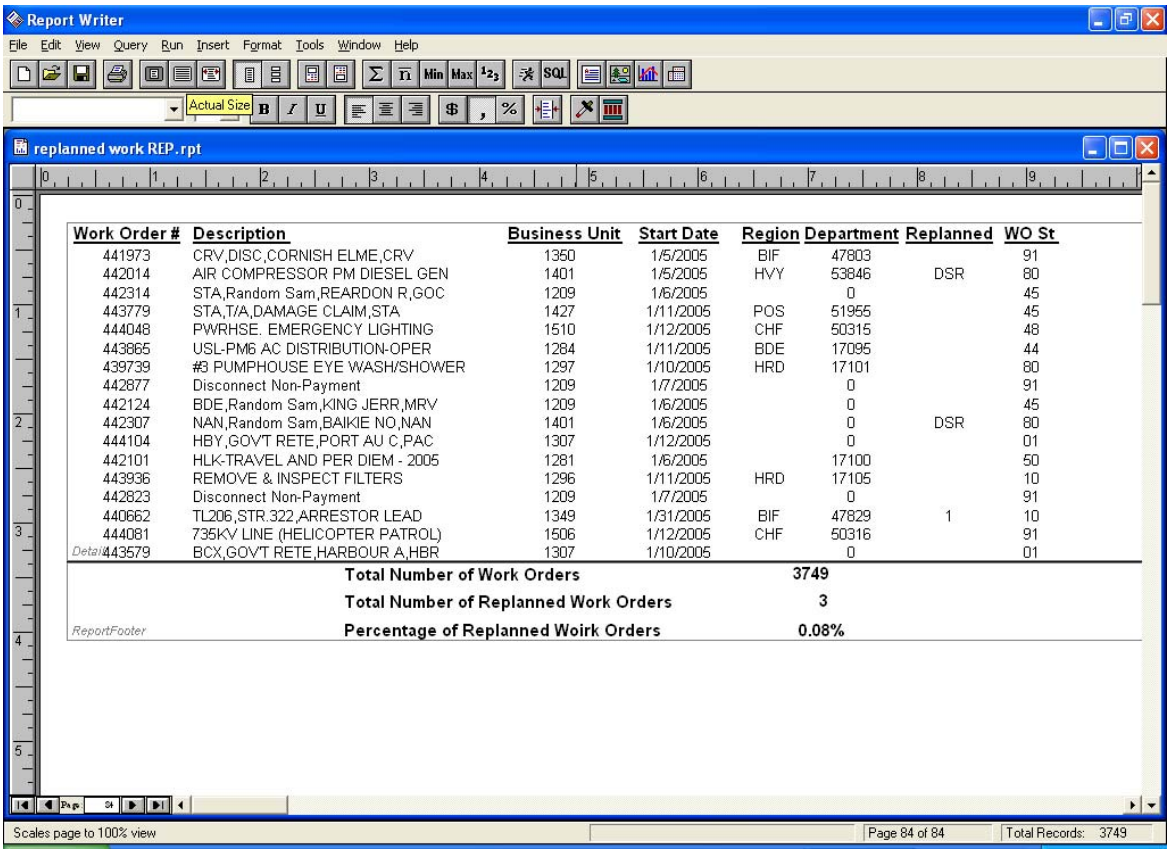

Work Order #	Description	Business Unit	Start Date	Region	Department	Replanned	WO St
441973	CRV,DISC,CORNISH ELME,CRV	1350	1/5/2005	BIF	47803		91
442014	AIR COMPRESSOR PM DIESEL GEN	1401	1/5/2005	HVY	53846	DSR	80
442314	STA,Random Sam,REARDON R,GOC	1209	1/6/2005		0		45
443779	STA,T/A,DAMAGE CLAIM,STA	1427	1/11/2005	POS	51955		45
444048	PWRHSE. EMERGENCY LIGHTING	1510	1/12/2005	CHF	50315		48
443865	USL-PM6 AC DISTRIBUTION-OPER	1284	1/11/2005	BDE	17095		44
439739	#3 PUMPHOUSE EYE WASH/SHOWER	1297	1/10/2005	HRD	17101		80
442877	Disconnect Non-Payment	1209	1/7/2005		0		91
442124	BDE,Random Sam,KING JERR,MRV	1209	1/6/2005		0		45
442307	NAN,Random Sam,BAIKIE NO,NAN	1401	1/6/2005		0	DSR	80
444104	HBY,GOVT RETE,PORT AU C,PAC	1307	1/12/2005		0		01
442101	HLK-TRAVEL AND PER DIEM - 2005	1281	1/6/2005		17100		50
443936	REMOVE & INSPECT FILTERS	1296	1/11/2005	HRD	17105		10
442823	Disconnect Non-Payment	1209	1/7/2005		0		91
440662	TL206,STR.322,ARRESTOR LEAD	1349	1/31/2005	BIF	47829	1	10
444081	735KV LINE (HELICOPTER PATROL)	1506	1/12/2005	CHF	50316		91
Detail 443579	BCX,GOVT RETE,HARBOUR A,HBR	1307	1/10/2005		0		01
	Total Number of Work Orders				**3749**		
	Total Number of Replanned Work Orders				**3**		
ReportFooter	**Percentage of Replanned Woirk Orders**				**0.08%**		

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Percentage Rescheduled Work Orders

Introduction

This document is intended to provide a functional specification for measuring rescheduled work. The primary purpose of this metric is to provide a means, with little effort, to measure rescheduled work orders by extracting the information from JD Edwards.

Data Sources

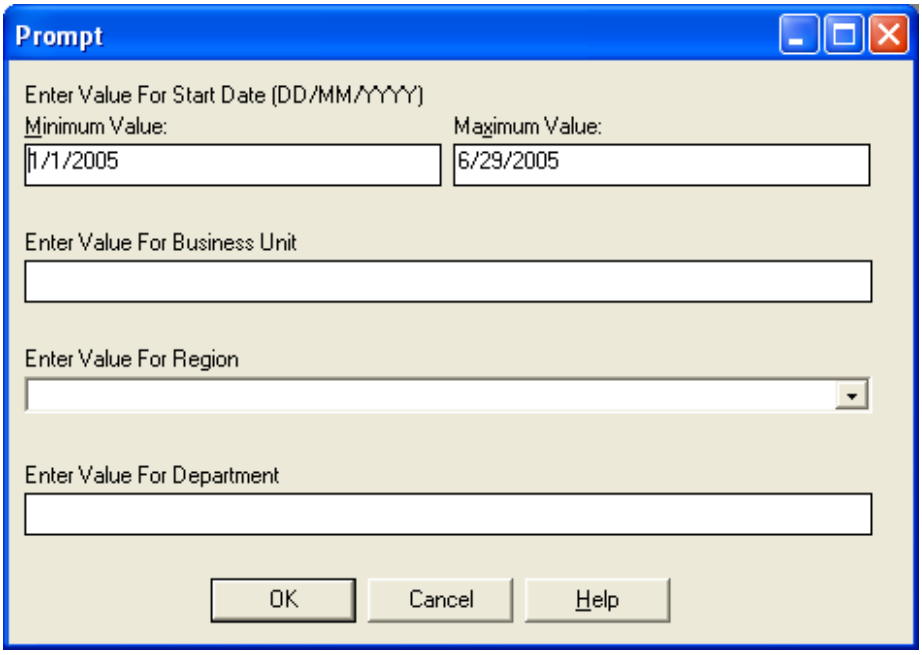
This report returns data from the following table(s) and Column(s) contained in JD Edwards

- **F4801**
  - Work Order Number
  - Business Unit
  - Start Date
  - Description
  - Planning Center
  - Department (Supervisor)
  - Status Code (Work Order)
  - Phase Code (RES)

Query Properties

A predefine “RES” for Rescheduled Work is embedded in the conditions of the report

Report Execution



1. Enter a valid Start Date (the last date will remain until changed)
2. Enter A Valid Business unit
3. Enter valid Region (you can select the pull down)
4. Enter a valid Department Number

Select RUN to Execute

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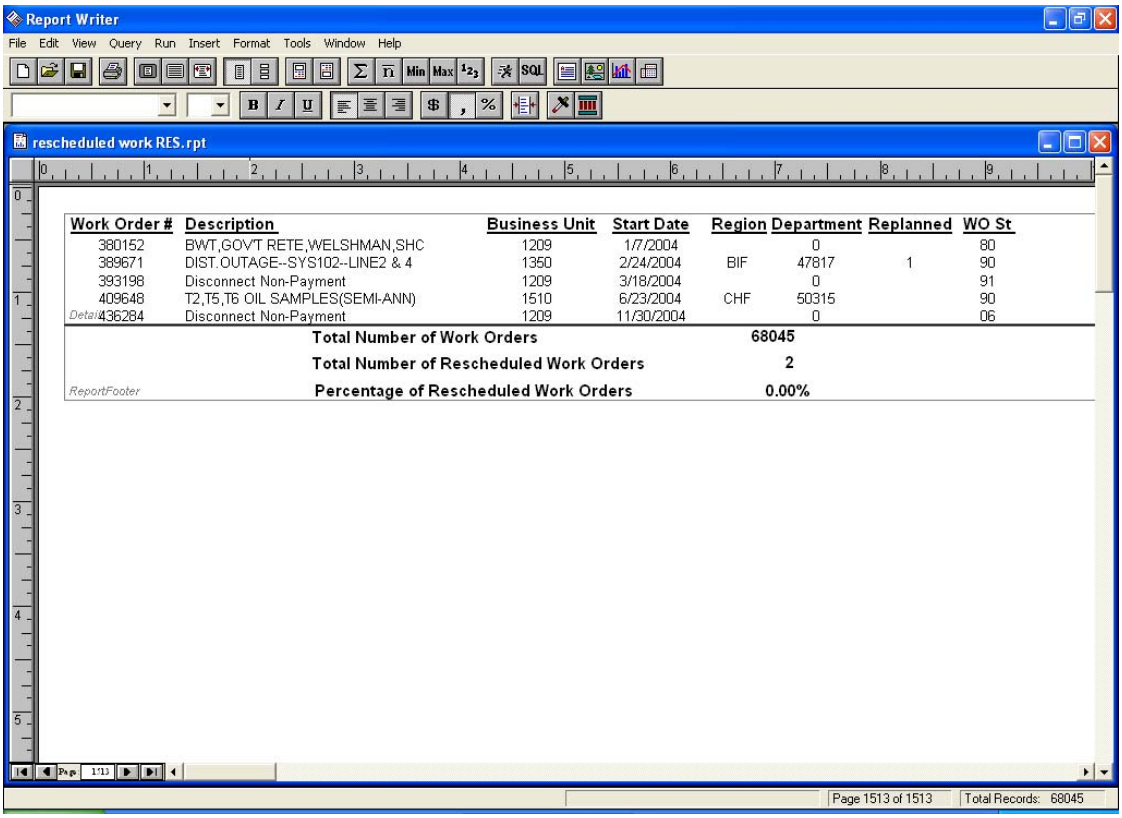

WRENCH TIME

Background

Wrench time is the primary measure of work force efficiency and of planning and scheduling effectiveness. Wrench time is the proportion of available to work time during which craft technicians are not being kept from productively working on a job site by delays such as waiting for assignment, clearance, parts, tools, instructions, travel, coordination with other crafts, etc. Work that is planned before assignment reduces unnecessary delays during jobs and work that is scheduled reduces delays between jobs.

Definition

This will be done in a non-scientific fashion by all levels of management every two years.

Metrics for Process

Metric	Generation Frequency	Generation Responsibility	Hydro Group Target	Industry Average
Percentage Weekly Schedule Compliance	Weekly – this may be a manual effort to start	Manager (Business Unit/ Labour) and Frontline	To be determined by Division/Plant	80%
Percentage Work Order Compliance to Estimates (Within +/- 15%)	Quarterly and year-end.	Planning Superintendent/ Supervisor or designate	Division/ Plant target to be determined and set as part of goals & objectives	65%
Percentage Emergency Person Hours Worked	Reportable quarterly with a lag of at least two weeks and at year-end.	Planning Superintendent/ Supervisor or designate	Division/ Plant target to be determined and set as part of goals & objectives	10% or less
Percentage Planned Person Hours Worked	Reportable quarterly with a lag of at least two weeks and at year end	Planning Superintendent/ Supervisor or designate	Division/ Plant target to be determined and set as part of goals & objectives	90%
Percentage Preventative Maintenance Coverage	Report on demand and annually	Planning Superintendent/ Supervisor or designate	Division/ Plant target to be determined and set as part of goals & objectives	30% or greater
Percentage Re-Scheduled Work Orders	Report on demand Recommend Monthly	Planning Superintendent/ Supervisor or designate	Division/ Plant target to be determined and set as part of goals & objectives	N/A
Percentage Re-Planned Work Orders	Report on demand Recommend Monthly	Planning Superintendent/ Supervisor or designate	Division/ Plant target to be determined and set as part of goals & objectives	N/A
Wrench Time	Bi- Annual Internal Survey	Corporate Initiative	-	-

Metrics for Measuring Compliance to Annual Work Plan Types

Metric	Generation Frequency	Generation Responsibility	Hydro Group Target	Industry Average
Percentage Preventive Maintenance Compliance	Quarterly and year-end.	Planning Superintendent/ Supervisor or designate.	To be determined by Division/Plant.	N/A
Percentage Operating Projects Completed	Annually	Planning Superintendent/ Supervisor or designate.	To be determined by Division/Plant.	N/A
Percentage Capital Projects Completed	Annually	Planning Superintendent/ Supervisor or designate.	To be determined by Division/Plant.	N/A
Percentage Non-Maintenance Work Orders Completed	Annually	Planning Superintendent/ Supervisor or designate.	To be determined by Division/Plant.	N/A
Compliance to Corrective Maintenance Budget	Annually (year-end)	Asset/BU Manager	To be determined by Division/Plant.	N/A
Compliance to Preventive Maintenance Budget	Annually (year-end)	Asset/BU Manager	To be determined by Division/Plant.	N/A
Compliance to Non-Maintenance Budget	Annually (year-end)	Asset/BU Manager	To be determined by Division/Plant.	N/A
Compliance to Operating Project Budget	After project completion.	Project/Asset Manager	To be determined by Division/Plant.	N/A
Compliance to Capital Project Budget	After project completion.	Project/Asset Manger	To be determined by Division/Plant.	N/A

Note: Any of those metrics can be generated on demand but as a minimum must be done as per frequency provided above.

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Weekly Schedule Generator

User Guide

February 16, 2005

Newfoundland & Labrador Hydro
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1.1 Overview

The Weekly Schedule Generator is an MS-Excel application that allows interactive scheduling of planned work orders on a weekly or even daily basis. The fundamental function of the weekly schedule generator application is to provide a means to schedule work for every available craft hour. The assumption is that planned work orders will have advanced through the work order statuses in JDE to what is referred to as the planned backlog statuses. At this stage of the work order life cycle labour estimates have been applied, materials and/or services are available and the work is ready for scheduling. The weekly schedule Generator extracts applicable work order information as specified by the user from JD Edwards and allows work order selection to a schedule with an instant comparison craft hour loading to available craft hours.

1.2 Initiating the Application

The Weekly Schedule Generator spreadsheet application is deployed to user 'Y' drives and can be accessed by user Citrix Desktop icon or through Windows Explorer.

The spreadsheet can be viewed and modified with any system that has MS-Excel installed.

If the spreadsheet is to be used to query JDEdwards, it **must** be initiated from one of the following:

- Citrix Desktop Icon (see below)
- Citrix Windows Explorer (**y:\citrixapps\bpi-wsg\WSG.xls**.)
- Thin-Client published desktop
- As an attachment in a Lotus Notes email with Notes client accessed via Citrix
- Desktop or laptop computer with MS-Excel and IBM Client Access drivers (access file **y:\citrixapps\bpi-wsg\WSG.xls)**

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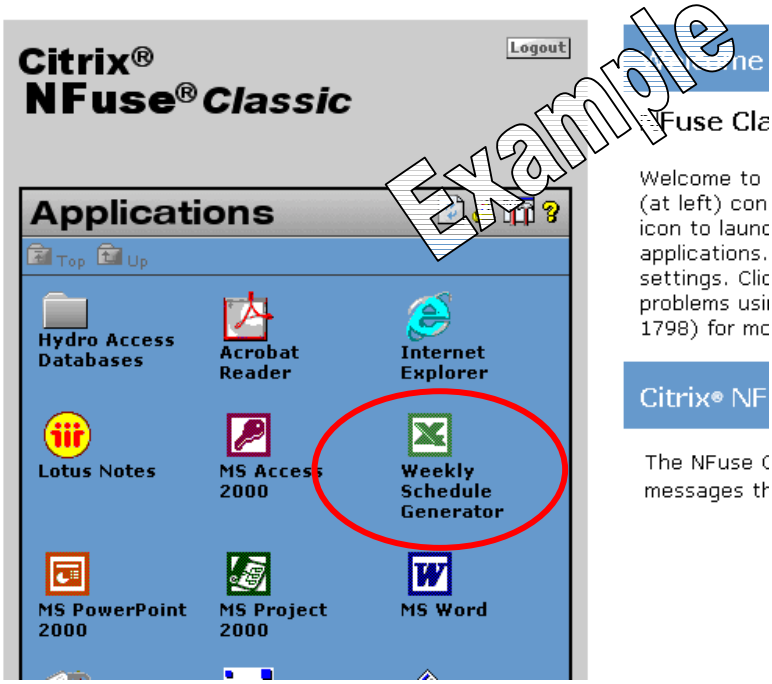
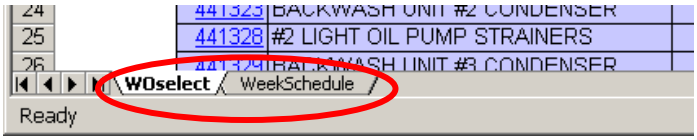


The Excel spreadsheet has two sheets, a **WOselect** sheet for selecting work orders and a **WeekSchedule** sheet for showing or manipulating the schedule. These sheets can be selected at the bottom portion of the worksheet area:



Generating a schedule involves five steps:

1) Query JDEdwards with appropriate criteria to retrieve work orders that have been assigned or created for a particular planning centre.

2) Enter available hours for each craft

3) Select desired work orders to schedule

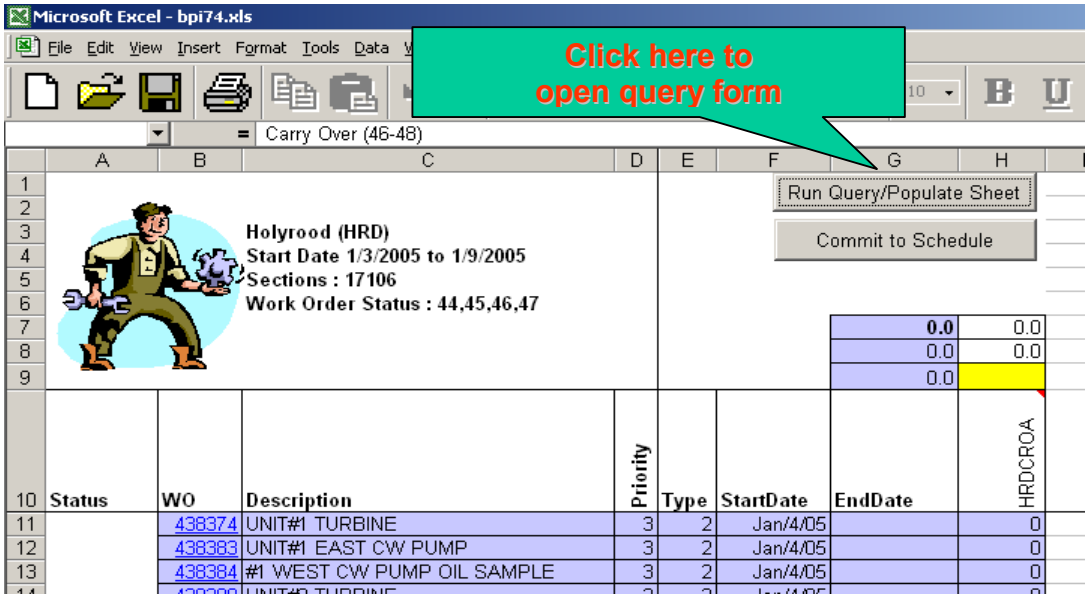
4) Generate a schedule by selecting the desired crafts and number of days to schedule.

5) Print or save the committed schedule

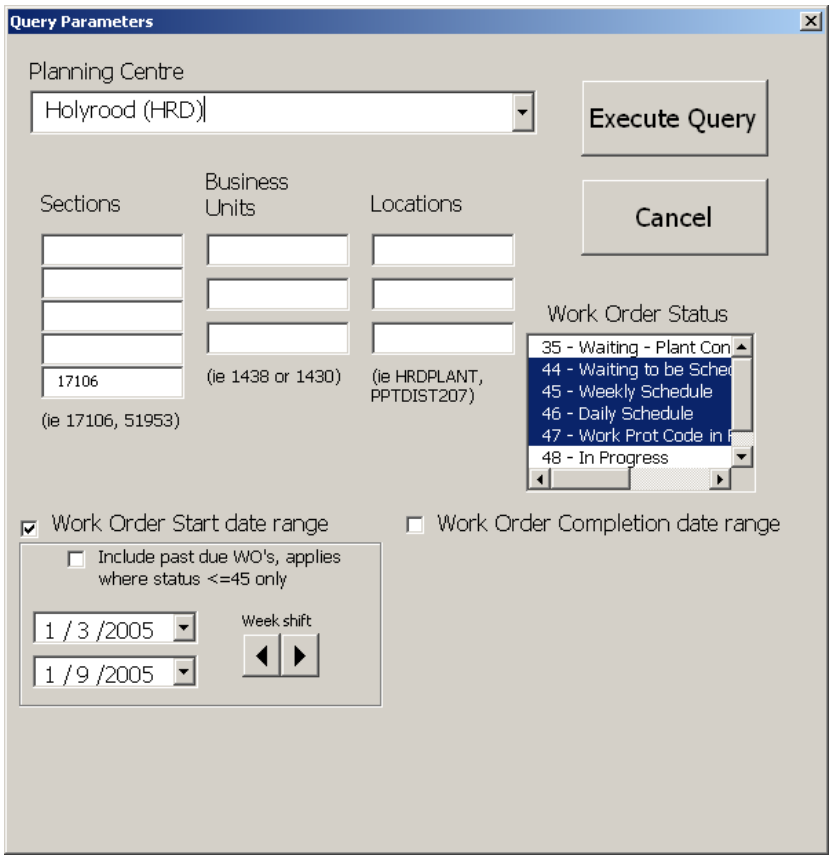
These steps are described in detail in the following sections.

1.3 Query JDEdwards

From the **WOselect** sheet of the Excel spreadsheet, click the 'Run Query/Populate Sheet' button to open the Query Parameters form, which allows entering of query parameters.



From the Query Parameters form it is possible to enter several optional parameters for defining what Work Orders to retrieve from JDEdwards. Any parameters that are defined are saved with the worksheet and are presented as the default values the next time the form is opened.



1.3.1 Planning Centre

A drop down-list of planning centres is available for selection. Only work orders that have the indicated planning center will be retrieved from JDEdwards.

1.3.2 Sections

Up to five Sections may be defined as query parameters. Work Orders that have any of the indicated Sections and meet the other criteria on the form are returned in the query results from JDEdwards. Blank fields are ignored.

1.3.3 Business Units

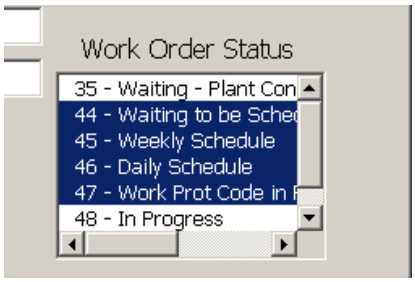
Up to three Business Units may be defined as query parameters. Work Orders that have any of the indicated Business Units and meet the other criteria on the form are returned in the query results from JDEdwards. Blank fields are ignored.

1.3.4 Locations

Up to three Locations may be defined as query parameters. Work Orders created for assets that are in the indicated Locations are returned in the query results (provided the Work Orders comply with the other query parameters). Blank fields are ignored.

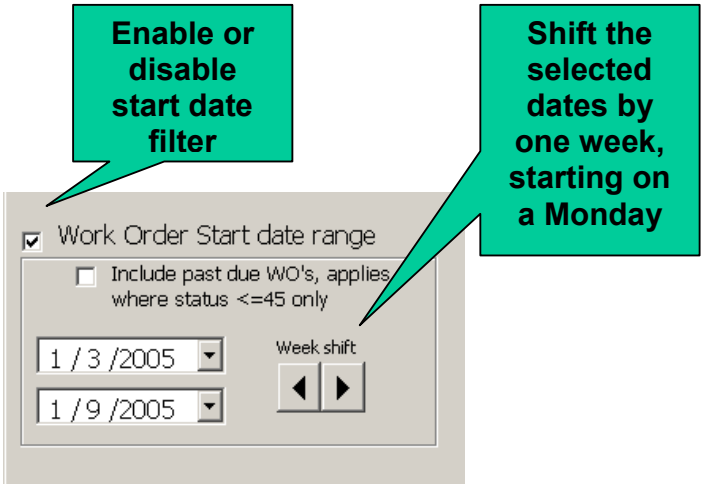
1.3.5 Work Order Status

It is possible to query on one or more specific work order status. Select or de-select the desired work order status' to query for.



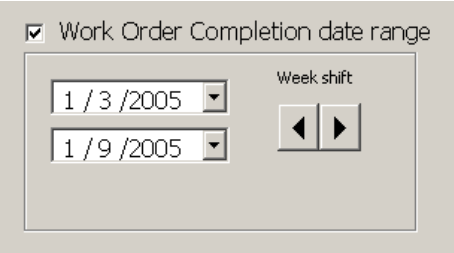
1.3.6 Work Order Start Date Range

It is possible to optionally filter for work orders with a specific start date. A date range can be specified so that only work orders with a work order start date within the range are shown.



1.3.7 Work Order Completion Date Range

Similar to the work order start date filter, it is possible to filter on the completion date for work orders. This filter can be enabled or disabled with the checkbox at the top left.



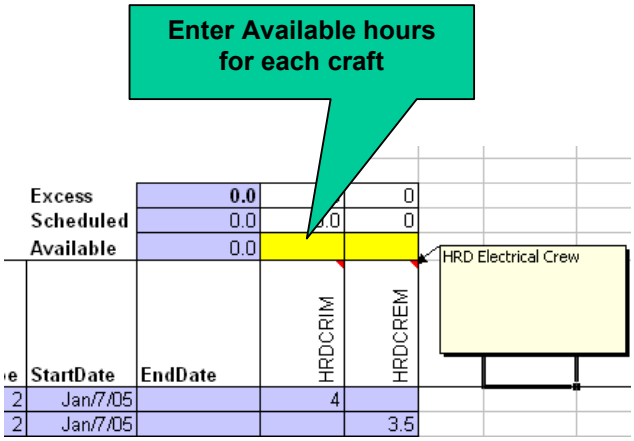
1.3.8 Executing the Query

Press the Execute Query button to run the query against JDEdwards. Depending on the query parameters, the query may take several seconds to complete. A progress indicator at the bottom of the query form indicates the status of the query. When the query is complete, the query form is closed and the results are shown on the **WOselect** sheet.

Note Note that executing the query will overwrite any work orders currently shown on the **WOselect** sheet and any **Available** hours entered for crafts.

1.4 Enter Craft Available Hours For Desired Work Orders

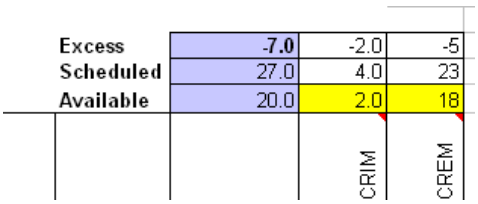
After completing the JDEdwards query, enter the available hours for each craft in the yellow region. As available hours are entered, the tally of total Available hours and Excess hours are recalculated. It is also possible to mouse-over the craft name header columns to get a detailed description of each craft code.



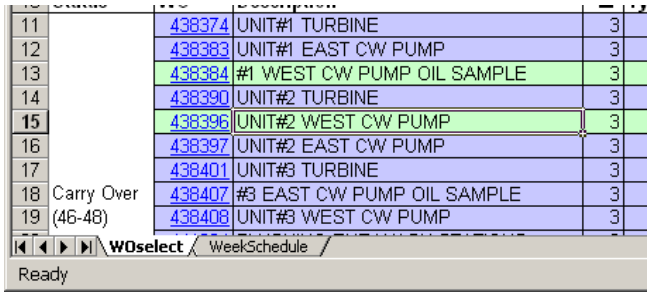
1.5 Select Desired Work Orders

After executing the JDEdwards query it is possible to select and de-select work orders to be transferred to the committed work schedule. At this stage, the objective is to select work orders that maximize the use of available labour. This is achieved by selecting work orders that result in the **Scheduled** and **Available** cells for each craft matching as closely as possible without **Scheduled** exceeding **Available**.

As work orders are selected and de-selected, the totals for **Excess** and **Scheduled** hours are adjusted for each craft.



Selected work orders are shown as Green and non-selected work orders are shown in Blue.

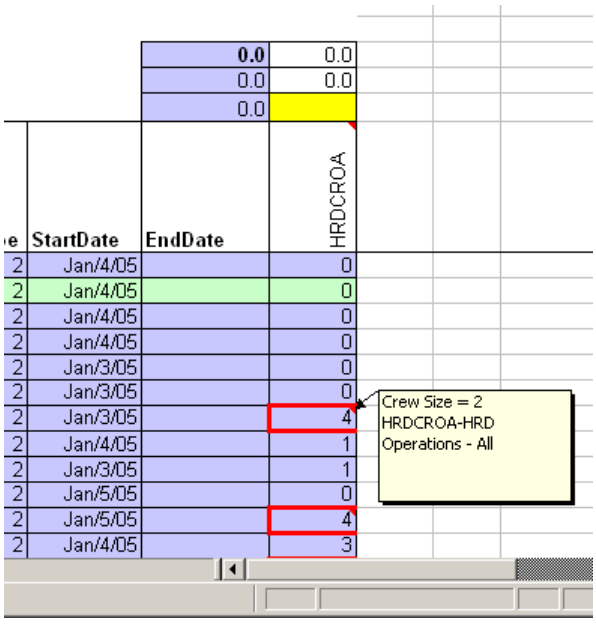


11		438374	UNIT#1 TURBINE	3
12		438383	UNIT#1 EAST CW PUMP	3
13		438384	#1 WEST CW PUMP OIL SAMPLE	3
14		438390	UNIT#2 TURBINE	3
15		438396	UNIT#2 WEST CW PUMP	3
16		438397	UNIT#2 EAST CW PUMP	3
17		438401	UNIT#3 TURBINE	3
18	Carry Over	438407	#3 EAST CW PUMP OIL SAMPLE	3
19	(46-48)	438408	UNIT#3 WEST CW PUMP	3

WOselect | WeekSchedule

Ready

The estimated labour hours from the work order for each craft are shown to the right of the work order completion date column. A cell with a red border indicates that the crew size for the craft is greater than 1. It is possible to mouse-over these type cells and view an Excel comment indicating the crew size and the craft name.

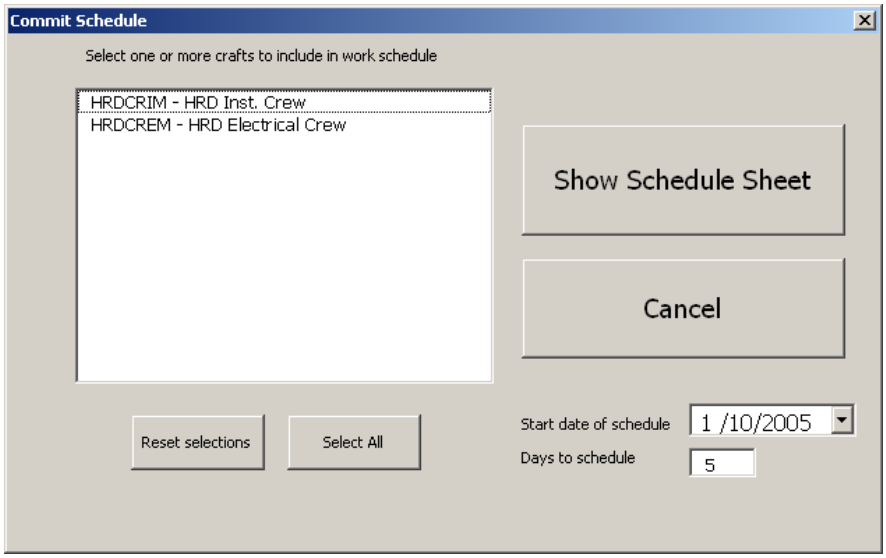


		0.0	0.0	
		0.0	0.0	
		0.0		
e	StartDate	EndDate	HRDCROA	
2	Jan/4/05		0	
2	Jan/4/05		0	
2	Jan/4/05		0	
2	Jan/4/05		0	
2	Jan/3/05		0	
2	Jan/3/05		0	
2	Jan/3/05		4	
2	Jan/4/05		1	
2	Jan/3/05		1	
2	Jan/5/05		0	
2	Jan/5/05		4	
2	Jan/4/05		3	

Crew Size = 2
HRDCROA-HRD
Operations - All

1.6 Generate Work Schedule(s)

Once the desired work orders have been selected and a balance between scheduled and available hours has been achieved, one or more committed schedules can be generated. The committed schedules can be tailored for specific crafts or groups of crafts. Click the **Commit to Schedule** button to present the Commit Schedule form.

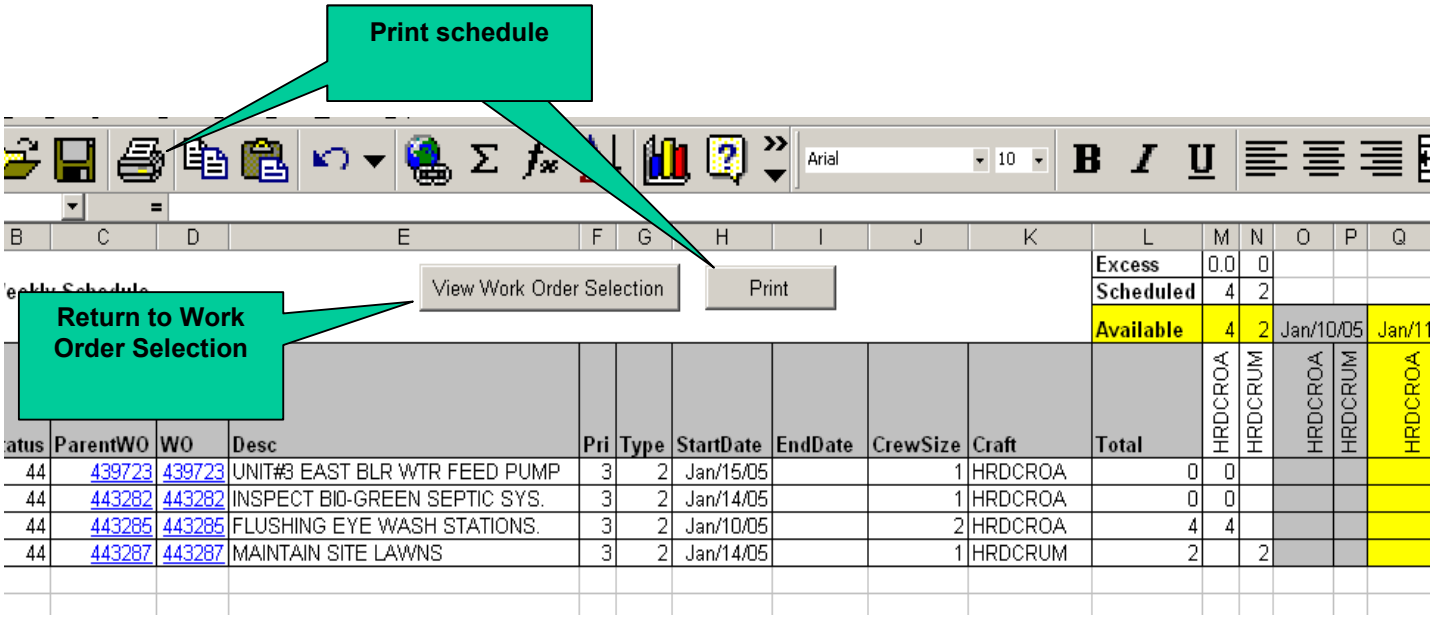


From this form it is possible to select crafts that are to be shown on the committed schedule. Any of the selected work orders that have the selected crafts will be shown. As well, any other crafts on the selected work orders will be shown on the committed schedule. The committed schedule will have the available hours for each craft as they were entered on the **WOselect** sheet.

This form also allows selection of a start date and the number of days to schedule. These days will be shown on the committed schedule, extending to the right edge of the sheet.

1.7 Print or Save the Work Schedule

Once the schedule has been committed, it can be copied, modified or altered like any other Excel spreadsheet. Scheduled and available hours may be altered and any final adjustments to the spreadsheet may be made. The sheet can be printed using the standard MS-Excel print functions or with the Print button in the header portion.



When the worksheet is saved, all information is saved, including the most recent query parameters, the work order selections and the committed schedule.

Appendix

What it won't do…

Keep schedule related information when you refresh the query (i.e. work orders list).

Update work order information in JDE automatically.

Prevent a user form corrupting the spreadsheet by deleting critical elements, formulas, etc.

Keep a work order high-lighted if you go back and edit it (or click on it in any way). If you click on a highlighted work order (in the WO Select screen) for any reason, it becomes un-highlighted and you have to click it again to re-select it.

Won't consider or reflect the high level work schedule and budget/work plans, that has to be manually considered.

Automatically track compliance measures.

What it will do…

Pick up all work orders meeting prompt criteria.

Allow user to select specific work orders for the Weekly Schedule.

Allow user to enter the available person-hours by craft.

Calculate required person-hours by craft based on selected work orders.

Calculate unscheduled hours by craft by subtracting required person-hours from available.

Allow user to modify spreadsheet, typical of any Excel spreadsheet.

Allow user to overwrite text and fields and hour estimates, etc.

Allow user to add text to the spreadsheet.

Allow the user to delete unwanted cells, rows or columns.

Allow the user to download a copy of a controlled version, work with that copy and save it for reference or distribution under a different file name/location.

You can manually overwrite personhour estimates on the WO Select screen and/or add estimates where none exist (side note that if you click onto a selected job to add hours, it will take the hours but become deselected (blue), you have to click it again to select to schedule).

Personhours shown for standing and in progress (46 - 48) work orders are the original estimates with no adjustment for any completed work - as I said you can overwrite them.

Allow users to manually enter job compliance estimates against each work order (using an empty column) and sum the values and calculate average Job Compliance, which can be manually trended. Text notes can also be saved against Job Compliance numbers in another empty column.

Allow the user to save versions and views of the Weekly Schedule with different filenames (convention required to standardize naming).

Allow the user to schedule for more than a week or further into the future than next week. The user can decide which time frame is desired, enter the appropriate available person-hours by craft for that time frame and select appropriate work orders for that time frame.

What is required of user…

Understanding of applicable codes on work orders and how to interpret/use them.

Understanding of basic Excel, including adding text, cut, copy and paste.

Understanding of how the query obtains and filters data.

Understanding of how to get a new copy if they break the one they have.

Understanding of the file naming convention and where and how to save copies for history.

Things to watch…

The link to detailed work order information pulls many fields related to the work order, all of which are used somewhere in JDE for different purposes. Some of the estimate and actual data may not be what the user expects and should be viewed with caution.

Newfoundland & Labrador Hydro Group of Companies

Routine Work Prioritization

Routine Work Prioritization Guide

Work Order Number: _____

Evaluation Factors:

1) **Importance = (a)*(b)*(c)*(d)*(e)*(f)**

(a) The work is: Reject if (a) = 0

Other	Corporate Mission Support	Justifiable	Necessary	Essential
0	1	2	3	5

(b) The loss type is:

None	Facilities / Equip.	Production	Delivery	Safety & Health or Environment
1	2	3	4	5

(c) Equipment Criticality:

Other	Standby Unit in Critical System	Critical to Plant or Station	Critical to Entire System	Critical Safety Protective Device
1	2	3	4	5

(d) Loss can be mitigated by:

Available Redundant Equipment	Available Backup Option	Nothing
1	3	5

(e) Loss probability is:

Low	Medium	High
1	3	5

(f) Loss Potential is:

Minimal	Moderate	Substantial
1	3	5

Total = (a)*(b)*(c)*(d)*(e)*(f)

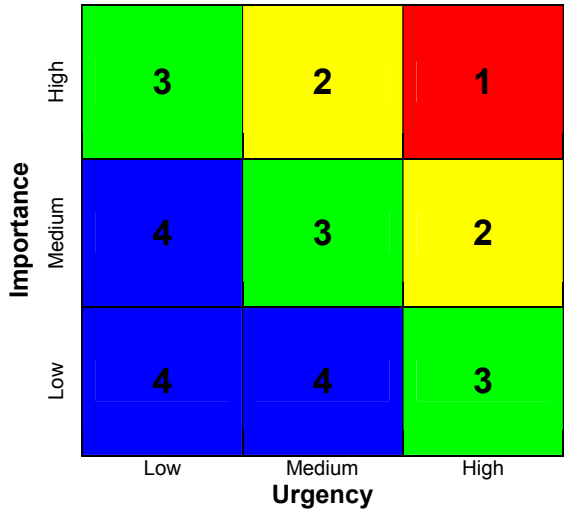
Low	Medium	High
< = 72	**73 – 1619**	**> 1619**

2) **Urgency:**

How long can the work be delayed before the above loss is incurred?

Low		Medium	High
N/A	**> 1 month**	**<= 1 month and > 1 week**	**<= 1 week**

3) **Priority Matrix:**



Priority Action Timeframe

- Immediately
- 1-7 Days with Target Start
- 8 Days – 4 Weeks with Target Start
- Schedule as Required with Target Start

The above provides a simple, standard methodology for evaluating and prioritizing the majority of day-to-day routine work. It provides a mechanism for combining a few evaluation factors to produce an overall level of importance, which in turn, when combined with urgency, will determine the priority of the planned piece of work. It also provides a record of the evaluation for future benchmarking purposes. It is not meant to replace good judgment or discussion between work planners, but to provide some factors to consider when prioritizing work. This methodology should be applied to all routine day-to-day work. While OP, CP and NM initiatives will be prioritized using the Work Identification & Prioritization project/initiative evaluation methodology, individual work orders cut against them should be prioritized using this methodology. The user of the above sheet would simply pick the appropriate fields and the calculation of the importance and urgency and the resulting priority would be done automatically. If the total for importance exceeds the medium range, before completing all importance factors, it wouldn't be necessary to complete the remainder of the importance factors.

Evaluation Factors:

The following provides some guidelines when assessing the range of each evaluation factor. Both importance and urgency can evolve due to changes in circumstances and these can ultimately impact the priority.

1) Importance

(a) **"The work is?"** This factor covers the work category.

- **Other:** The work is not required and should be rejected if it doesn't fit into the following work categories.
- **Corporate Mission Support:** At a bare minimum, our work should support our corporate mission by aligning to our goals and objectives. For example, enhancing our public image through provisions of materials and labour for municipal celebrations.
- **Justifiable:** This refers to work that will provide a benefit to the company that outweighs its cost. These benefits may be financial or non-financial (E.g. Improved customer service index)
- **Necessary:** This refers to work required to maintain facilities and operations in adequate condition to meet anticipated activity levels. For example, a derated unit at Holyrood may be required at full load within a week because of system load projections. More examples of necessary work would be JD Edwards is down (during normal service hours), the AS400 production machine is down, or the Corporate LAN is down.

- **Essential:** Work that is required to meet government regulations, legal requirements, or minimum environmental/safety standards. For example, work to address a class "A" safety hazard or work covered under the wood pole agreement with Aliant would be considered essential.

(b) **"The loss types"** are as follows:

- **None** if there is no loss associated with not performing the work.
- **Facilities/Equip.** if there is a potential or existing loss of support facilities or equipment not directly related to the production or delivery of electrical energy. For example, line depots, regional offices, Hydro Place, servers, office equipment could be covered under this loss type.
- **Production** if there is a potential or existing loss to equipment or systems related to the production of electrical energy such as hydraulic or thermal generating equipment, dams, control structures, etc. This type focuses on unit unavailability without having major customer delivery implications.
- **Delivery** if there are potential or existing customer outages resulting from equipment or systems involved in the production, transmission or distribution of electrical energy. The focus here is on external customer outages due to generation unavailability, transmission line or distribution feeder outages.
- **Safety & Health or Environment** if the loss has or will have an impact on employee or public safety and health such as rotten wood poles, defective distribution disconnects, line road crossings, etc. or on the environment such as a potential contaminant release.

(c) **"Equipment Criticality"** asks for an indication of how critical the equipment is to the company's operations.

- **Other** is used to capture all equipment/systems that are less critical than those in the following groups.
- **Standby Unit in Critical System** would cover equipment like backup chargers in terminal stations, ring bus breakers in terminal stations, backup 230 kV line protection, parallel lines, etc.
- **Critical to Plant or Station** covers equipment/systems that are critical to a plant's or station's function such as line breakers, power transformers, RTUs, radial lines, etc.

- **Critical to Entire System** covers equipment/systems that are critical to the an entire system's function, whereby system is defined as the main power grid (interconnected island or Labrador) or any isolated diesel system,

- **Critical Safety Protective Device** covers equipment/systems that are in place to provide safety protection in the event of equipment failure such as pressure relief valves, surge tanks, fire alarm/protection systems, etc.

(d) **"Loss can be mitigated by"** covers the kind of mitigation that could offset the impact of the loss.

- **Available Redundant Equipment** covers equipment/system that is a direct replacement for the equipment experiencing the loss. For example, this would include a parallel battery bank charger, a parallel line or transformer, a spare diesel unit, backup line protection, etc.

- **Available Backup Option** covers options that are not direct replacements but provide the same function. These options would usually come at some extra cost. For example, mobile substations/diesel units/ transformers, temporary bypasses, alternate feeds, etc.

- **Nothing** covers the case where there are no options for mitigating the loss.

(e) **"Loss Probability"** provides an indication of how probable the loss event may occur. This will require judgment based on equipment history and present condition and may also be influenced by external factors such as weather forecasts, load projections, system conditions, season, etc.

(f) **"Loss Potential"**: An assessment of the loss extent that could be suffered to people (loss of life, injury, etc.), environment (spills, exposures, hazards, etc.) and/or plant/asset/equipment/systems if the job is not completed soon. This is not a probability assessment but an indication of how much damage could occur. This again will require judgment based on system knowledge and external factors. For example, if delaying a job could result in no injury, low plant/asset/equipment loss and significant environmental loss, then the loss potential would be substantial due to the environmental factor. Another example could be a computer virus, which affects a few people but has the potential to affect every user. This case would have a substantial loss potential. The loss potential extent should also be evaluated in terms of its cost. For example, minimal loss potential could be a cost of less than $1,000. Moderate loss potential could be a cost of $1,000 to $10,000 and substantial could be greater

than $10,000. These limits would have to be agreed upon before implementing this methodology. Another consideration is the loss's impact on the system. For example, if the loss is limited to local systems such as a local server, security system, air conditioning unit, vehicle, etc. or parts of systems such as a distribution feeder, a terminal station, a generating unit in a multi-generator plant, etc., then it may be considered a moderate loss. However, if the loss affects or will affect an entire system such as the Island grid, an isolated diesel system, an interconnected distribution system, the ECC control system, all PC users on the corporate network (E.g. Software virus), etc., then that should be considered a substantial loss. Staff productivity needs to be considered here in the case of losses associated with facilities or equipment like servers, buildings, printers, etc. The loss potential could range from one person (i.e. minimal) to all users (i.e. substantial).

2) Urgency

This factor takes into account the timing requirements of the work. This is again a judgment call that takes into account risks. One needs to consider the above loss potential(s), along with its probability, to determine how long the work can be delayed before incurring the loss(es). Influencing factors could be weather or season, unit outage coordination, load projections, coordination with other higher priority work, or work type (E.g. Preventive maintenance, Corrective Maintenance, etc.). For example, an impending lightning or sleet storm may necessitate that work be carried out within the next 2 days or a planned unit outage may be coordinated with previously unidentified work to take advantage of the outage. In any case, the urgency chosen needs to be justified based on some risk assessment. The user will indicate N/A (i.e. not applicable) for work that doesn't have any losses associated with it.

3) Priority Action Time Frames

The following timeframes are merely guidelines for planners when scheduling work. They may be impacted by resource (human and goods & services) availability. The main emphasis is that **higher priority work should get completed before lower priority work**.

Priority 1 = Immediately (An injury has occurred or may occur; customer outage is ongoing or pending; necessary production is stopped or about to be stopped; or significant damage to plant/asset/equipment or environment has occurred or may occur. This is urgent reactive work of high importance, with no planning or scheduling within JDE).

Priority 2 = 1 Day - 7 Days with target start date (Work must be started as promptly as possible with some planning done prior to it's commencement, as time permits. This is reactive work with some planning and scheduling within

JDE.) This work is of an either high urgency and medium importance nature; or medium urgency and high importance nature.

Priority 3 = 8 Days - 4 Weeks with target start date (This is important proactive work that is not urgent and must be fully planned and scheduled within JDE.) This work is of an either high urgency and low importance nature; medium urgency and medium importance nature; or low urgency and high importance nature.

Priority 4 = Schedule as required with target start date (Any work that is required to be done but is not, at this time, affecting safety, health, environment, production or cost. It may be upgraded to another priority should the work become more urgent due to deteriorating or changing conditions. This is required proactive work of low to medium importance and low urgency or low to medium urgency and low importance that must be fully planned and scheduled within JDE).

Newfoundland & Labrador Hydro
Group of Companies

JOB PLAN REPOSITORY

Background

In the past, maintenance planners have used various methods of keeping job records to use for future job planning and in some instances job plans have not been saved. The result is bits and pieces of information stored in a many locations, and in worst cases, repetitive jobs have been planned more than once. These job plans reduce the need to do site visits, reduce the time required to prepare a job for release, and improve accuracy of estimates of labor and material requirements. These plans were not usually revised to include any lessons learned.

Step 3 Planning, box 13 Extensive Planning in the work execution flowchart for routine work identifies the requirement to utilize existing job plans. The expectation is to store job plans for future planning in an effort to reduce the amount of time spent by planners preparing jobs that have been done before and will likely be done again. Today, these plans are being filed in different ways by different planning centers. What is required is a Job Plan Repository. A common bank of stored job plans that can be accessed by planners, known as a Job Plan Repository, will be extremely beneficial to the planning department. Job plan data may be extracted from work methods, job procedures, engineering directives and other sources.

Purpose

The primary purpose of the Job Plan Repository is to provide planners with a data bank of job plans to draw upon so that every job does not have to be planned from scratch. The planner must do research to create job plans. It is not only the key lessons learned over the past years but also and more importantly the thousands of minute details of particular jobs on particular equipment that can make the difference between a 2-hour job and a 5-hour job. It is the ability to capture this information and apply it to future work precisely when needed that makes the job plan repository valuable to the planner and hence to the company.

Newfoundland & Labrador Hydro
Group of Companies

Prioritization Calculator

Background

Consistent application of priorities for routine work orders has always been an issue throughout the Hydro Group. A guide has been developed to assist in determining proper priorities. The guide provides a mechanism for combining several evaluation factors to produce an overall level of importance, which in turn, when combined with urgency will determine the priority of the work. This guide is not intended to replace good judgment and there may be cases where the guide is not well suited.

Purpose

The purpose of the Prioritization Calculator is to allow the user of the Prioritization Guide to simply select the importance factors and urgency rating and the resulting priority will be automatically calculated. The Prioritization Calculator eliminates the manual calculation process.

Newfoundland & Labrador Hydro Group of Companies

Routine Work Prioritization Guide

Work Order Number: _____

Evaluation Factors:

1) **Importance = (a)*(b)*(c)*(d)*(e)*(f)**

(a) The work is: (Reject if (a) = 0)

Other	Corporate Mission Support	Justifiable	Necessary	Essential
0	1	2	3	5

(b) The loss type is:

None	Facilities / Equip.	Production	Delivery	Safety & Health or Environment
1	2	3	4	5

(c) Equipment Criticality:

Other	Standby Unit in Critical System	Critical to Plant or Station	Critical to Entire System	Critical Safety Protective Device
1	2	3	4	5

(d) Loss can be mitigated by:

Available Redundant Equipment	Available Backup Option	Nothing
1	3	5

(e) Loss probability is:

Low	Medium	High
1	3	5

(f) Loss Potential is:

Minimal	Moderate	Substantial
1	3	5

Total = **(a)*(b)*(c)*(d)*(e)*(f)**

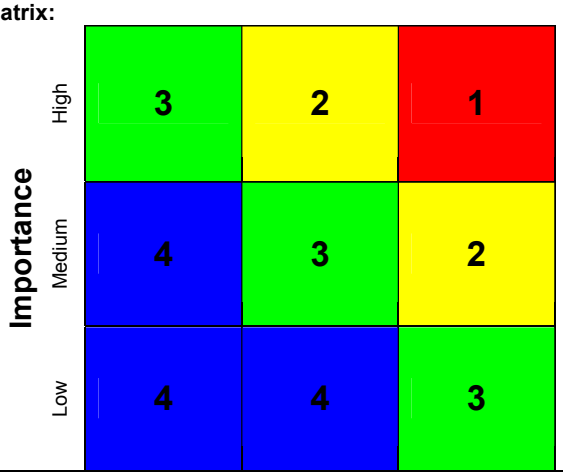
Low	Medium	High
< = 72	73 – 1619	> 1619

2) **Urgency:**

How long can the work be delayed before the above loss is incurred?

Low		Medium	High
N/A	> 1 month	<= 1 month and > 1 week	<= 1 week

3) **Priority Matrix:**



Priority Action Timeframe

- Immediately
- 1-2 Days with Target Start
- 8 Days – 4 Weeks with Target Start
- Schedule as Required with Target Start

Weighted by Importance

Outage Database

This tool as been passed to another PIT team for development.

Background

The outage Management subprocess was originally identified as a function of the Work Execution process. As a result of progress on the Work Execution process, and development in the Work Identification and Prioritization and Work Budgets process, it became apparent that there is an opportunity to further streamline and harmonize activities related to asset outages. It also became apparent that there is an opportunity to more fully define the roles and responsibilities of various positions in the organization as it relates to managing asset outages from preliminary concept through to eventual completion. Accordingly, the Outage Management subprocess was extracted from the above three processes for further work, leading to the current proposal.

As the Outage Management subprocess is in fact a component of the three processes, the relationship with the overall Corporate Strategic Plan is derived accordingly. More specifically, the Outage Management subprocess contributes to the overall goal of optimizing corporate performance by supporting these processes. Understandably, much of the Outage Management charter grounds its content in those of the Work Identification and Prioritization, Work Budgets, and Work Execution Process, with particular emphasis on the latter.

Purpose

When the Outage Management subprocess has been improved, equipment outages will be more effectively utilized across functional and departmental lines, leading to an increase in equipment availability, a reduction in repeat equipment maintenance outages, and the establishment of clear roles and responsibilities in the outage requesting-approval process from project identification through to work completion. By implementing the Outage Management subprocess, the organization will be better able to leverage the expected improvements associated with Work Identification, Work Budgets and Work Execution initiatives.

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GLOSSARY OF TERMS

Assumptions: Factors that, for planning purposes, are considered to be true, real or certain. Assumptions affect all aspects of project planning, and are part of the progressive elaboration of the project. Project teams frequently identify, document and validate assumptions as part of their planning process. For example, if the date that a key person will become available is uncertain, the team may assume a specific start date. Assumptions generally involve a degree of risk.

Backlog (Planned): Work orders planned and prioritized, waiting scheduling and execution.

Benchmarking: A continuous improvement process of examining companies that are more effective in a specific process learning how they became more effective and then adapting their methods to your company's process with a goal of improving your process.

Capacity:

Communication: A process by which information is exchanged between individuals through a common system.

Compliance: Adherence to a defined process (i.e. schedule).

Computerized Maintenance Management System: A computer program that manages the performance of maintenance through work orders. (i.e. J.D. Edwards)

Constraints: A constraint is an applicable restriction that will affect the performance of the project. For example, a predefined budget is a constraint that is highly likely to limit the team's options regarding scope, staffing and schedule. When a project is performed under contract, contractual provisions will generally be constraints.

Continuous Improvement: The process of constantly making a company's business processes better.

Execution: The act of actually doing the work.

Feedback: Information provided by assigned worker or supervisor on a job plan package that will enhance future packages.

Inventory: Spare parts or equipment components kept in case of an equipment breakdown or for replacement when the original part or equipment component wears out.

Load: Work submitted to a schedule, against known resource available, until schedule is filled to a percentage. (i.e. 100 hrs available---100 hrs submitted = 100% loaded)

Maintenance (Corrective): Any maintenance activity required to return assets to desired operating characteristics. Activities required correcting a failure that has occurred or is in the process of occurring. Usually the result of unexpected breakdown, emergencies, or items detected during inspections. May consist of repair, restoration or replacement of components.

Maintenance (Preventive): Planned and proactive maintenance activities (inspect, test, lubricate, clean, replace regular components etc) carried out on assets at pre-determined levels. The frequency established may be based on calendar time, or other occurrences such as starts, stops, odometer readings, number of operations, running hours etc.

Maintenance (Predictive): Maintenance activities (inspections, condition based monitoring) used to predict if and when future asset failures will occur. The prediction is based on trend analysis of diagnostic data collected by techniques such as vibration analysis; lube oil analysis, infrared testing, equipment history analysis etc. Predictions can also be experience based. (Visual inspection of wooden poles)

Maintenance: Any activity carried out to retain an item in, or restore it to, an acceptable condition for use or to meet its functional standard.

Metrics: Measures for checking how the process is functioning.

Performance Indicators: Descriptive signals that some action needs to be taken.

Performance Measurement: The act of measuring performance.

Planner: Any person who does planning on a piece of work. (i.e. assigns materials, assigns labour, does engineering, etc.)

Planning (Extensive): The degree of planning applied to large, critical and more complex pieces of work. Includes verifying/defining scope of job, providing labour estimate, identifying/specifying/procuring parts, and other requirements such as identifying/arranging special tools, arranging outages, developing drawings,

considering safety/environmental standards, coordinating with other departments, arranging transportation/accommodations, considering customer impact/coordination and any other detail required to complete the job.

Planning (Minimal): The degree of planning applied to smaller jobs of which it is not cost effective to spend much planning time on. Those jobs are normally short duration, single craft, low dollar value, of very little historical value and while parts may be required, the parts are normally low dollar value and readily available in stores or in consumable bins. Sufficient planning for this type of work should include clear description of work, labour estimate by craft and parts list if required.

Planning: A major strategy to improve maintenance efficiency with regard to unproductive time. Its provides crews with job scopes, labour estimates by craft, material requirements, and other information required to get the job done efficiently and effectively such as special tools, drawings, special procedures when available, outage arrangements, special permits etc.

Priority: The relative importance of a single job in relationship to other jobs. Safety, production, environment are major considerations in establishing priorities.

Procurement: A function within the organization that is responsible for obtaining and storing spare parts, equipment or raw materials required to support the maintenance function.

Project Deliverables: A list of the summary level sub products whose full and satisfactory delivery marks completion of the project. For example, the major deliverables for a software development project might include the working computer code, a user manual and a tutorial. When known, exclusions should be identified.

Project Objectives: The quantifiable criteria that must be met for the project to be considered successful. Project Objectives must include at least cost, schedule and quality measures.

Project Plan: The project plan is a formal, approved document used to manage project execution.

Reliability: The probability that equipment or an asset will perform its designed function without a failure for a period of time under specific conditions.

Resource Capacity Planning: Planning and scheduling work for a known number of resources (i.e. tools, manpower, etc.) Checking for over or under allocation of resources and levelling where possible.

Scheduling: Scheduling is primarily arranging planned work orders in the sequence in which they are intended to be done. It is also designating work to be done at a specific time. Good scheduling reduces lost time between jobs.

Scope: The extent and detail of the work to be done.

Stakeholder: Any person, organization, etc. directly impacted by the process.

Supervisor: A front line manager usually responsible for a group of employees executing work.

Target: The goal intended to be attained (and which is believed to be attainable).

Work (Capital): The acquisition, improvement or disposal of fixed or leased assets. Includes the cost of pre-engineering, feasibility, environmental or other studies.

Work (Non Maintenance): Work not directly associated with an asset. Example: Corporate Programs.

Work (Proactive): Work that is anticipated and planned for.

Work (Project): Work that is not addressed within the organizations normal operational limits. It has a definite beginning and definite end and is normally performed on assets on a one time or infrequent basis. It is usually unique in nature.

Work (Reactive): Work that occurs with little or no notice. This work interrupt schedules and cost much more than planned and scheduled work. Work that is performed as a response to a failure, breakdown or other urgent equipment situation.

Work (Routine): Routine work is ongoing and to some degree repetitive and is normally done to sustain the business. Routine work consists of corrective; preventive, non-maintenance and small capital such as service extensions and emergency upgrade work.

Work Package ????

Work Plan ????

Work Status ????? i.e. 48, 30 etc.

Work Breakdown Structure (WBS): A WBS is a deliverable-oriented grouping of project components that organizes and defines the total scope of the project; it is often used to develop or confirm a common understanding of project scope. Each descending level represents an increasingly detailed description of project deliverables.

Work Order: A document used to request, plan, schedule, track and report on all work activities.

Work Request: Formal request to have work performed. Subsequently transformed into a Work Order upon authorization.

Wrench Time: This is the proportion of available-to-work time during which craft technicians are not being kept from productively working on a job site by delays such as waiting for assignment, clearance, parts, tools, instructions, travel, coordination with other crafts or equipment information.

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POST IMPLEMENTATION REVIEW REPORT

Project Name:

Project Number:

Project Date:

Project Classification: ☐ **Operating** ☐ **Capital**

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1. Introduction

Project Information

Name of Project:

Project Owner:

Type of Project: *Application Development; Commercial Off-the-Shelf Application Implementation; Infrastructure Replacement; etc.*

Short Project Description:

Internal Contact Name: *This should be the Project Manager or other individual who can be contacted for information about this project.*

Process

Briefly describe the process used to gather information for the Post-Implementation Review including:
Review of project files;
Project Steering Committee survey;
Project Team survey; and,
Lessons learned meeting(s).

It would also be helpful to highlight any unusual factors or issues (which might have either positively or negatively affected the project) should be kept in mind when examining the Post- Implementation Review report for this project.

2. Overall Project Evaluation

This section should present a summary of the actual performance of the project against the planned performance. More specifically, it should outline:

- *Objectives: Actual performance in relation to the achievement of the planned project objectives.*
- *Project Schedule: Actual performance of the project against the project schedule.*
- *Project Budget: Actual performance of the project against the project budget.*

.

As well, this section should include a summary of the major project successes and challenges.

3. Scope and Deliverables (Quality Analysis)

This section should describe the actual performance of the project in relation to the planned results/deliverables and should address the quality of the deliverables. The planned project scope and deliverables as presented in the Project Plan, and approved Project Change Requests, should be included as well as the actual deliverables from the project.

With respect to the quality of project deliverables, state the original quality goals and summarize what really happened in relation to quality goals. Also note whether deliverables have been accepted/met owner expectations.

For projects that involve partners/vendors in the provision of products and services this section should state conclusions regarding whether the contractor has satisfied all obligations according to the Statement of Work and approved Project Change Requests.

Responses to questions from the Project Team Lessons Learned Survey and the Project Steering Committee Lessons Learned Survey that relate to project scope, roles and responsibilities, deliverables and quality should be summarized in this section.

4. Cost vs. Budget Analysis

This section should describe the actual cost of the project in relation to the budget. It should state the original budget, approved change requests and summarize actual costs by cost category. The following table can be completed to present the required information.

Table <#>: Budgeted and Actual Costs

Cost Category (Account Description)	Original Budget	Approved Change Requests	Revised Budget	Actual Costs	Variance
TOTAL					

- *Cost Category: Budget and actual cost information should be provided at an account level (e.g. Equipment/Material Supply; Internal Labour; External Forces) and for the project total.*
- *Original Budget: For capital projects, this information should be based on the Capital Job Cost.*
- *Approved Change Requests: Any financial impact of Project Change Requests approved by the Project Owner should be noted here. As well, for capital projects where the Divisional Vice-President has approved a budget increase[1], this change should be included.*
- *Revised Budget: Changes to the original budget resulting from approved change requests as well as re-forecasting of accounts by the project manager should be reflected in this column. The commentary in this section should briefly explain the requirement for the re-forecast (e.g. materials budget reduced to reflect results of tender).*
- *Variance: This column should present the variance between the revised budget and the actual costs.*

In addition to the financial information presented in the table, this section should reference reasons for variances and lessons learned regarding the financial aspects of the project. For example, in 2004 a number of capital projects were delivered with the assistance of an external partner while the budget for the project was developed based on the assumption that internal resources would complete delivery. Commentary for this section could reference this factor as the reason for the revisions to the internal labour and external forces accounts. A corresponding lesson learned is the requirement to determine the mix of internal and external forces for project delivery during the planning/budgeting process.

For projects involving Hydro's partner, this section should include budgeted and actual project effort for Hydro and Aliant-xwave resources.

In instances where a portion of the internal labour costs associated with the delivery of a capital project have been charged to an operating work order, these operating labour costs should be referenced in this section of the Post Implementation Review. This information can be used to assist in determining the total cost of project delivery and assisting in the budgeting of future projects.

Responses to questions from the Project Team Lessons Learned Survey, the Project Steering Committee Lessons Learned Survey and lessons learned meetings that relate to the financial aspects of the project should be summarized in this section.

[1] Based on the requirement that Divisional Vice-President approval is required when a capital job cost is exceeded by the lesser of 15% or $25,000.

5. Schedule Analysis

This section should summarize the actual performance of the project against the project schedule. It should outline the original schedule as committed in the Project Plan and adjustments to the schedule as outlined in approved Project Change Requests. It should also present the actual timelines achieved for key milestones. Any significant variances in the schedule and the reasons for these variances should be briefly stated.

Responses to questions from the Project Team Lessons Learned Survey, the Project Steering Committee Lessons Learned Survey and lessons learned meetings that relate to the project schedule should be summarized in this section.

If a project has been closed out for administrative/financial purposes but additional tasks must be completed, this section of the document should document this requirement.

6. Successes and Challenges

This section should address the successes and challenges of the project that have not been addressed in the previous sections of the Post-Implementation Review. The results of the Project Team Lessons Learned Survey and the Project Steering Committee Lessons Learned Survey can be used to identify particular themes or areas that should be the subject of further exploration at the group lessons learned meeting(s).

Appendix A outlines a series of questions that may be helpful in generating discussion about a number of different project considerations.

When identifying and presenting project successes and challenges, try and isolate specific things that worked well or caused problems. For example, rather than stating the team communicated well note that the tailgate meeting at the site prior to the RTU installation worked well.

7. Safety Performance

Present the key findings regarding safety performance for all aspects of the project. Reference the Corporate Safety and Health Program Segment 11, Safety and Health checklist.

8. Environmental Assessment

An assessment of the environmental components of project will include a review of the following where applicable:

1. Permits, approvals and letters of advice from regulatory agencies

   - Were regulatory approvals received in a timely manner? If not, were there problems during the application or review processes?
   - Were the conditions of permits and approvals reviewed for applicability to the work to be undertaken?
   - Were there any incidents of non-compliance with permit and approval requirements? If yes, explain.
   - Were completion reports or other follow-up documentation requirements of permits and approvals completed and submitted as required?

2. Environmental protection planning

   - Was an environmental protection plan developed and implemented?
   - Were mitigation and control measures effective? If no, explain.

3. Environmental emergency response planning (EERP)

   - Was an EERP developed and implemented?
   - Was there a need to enact the EERP? If yes, explain.

4. Inspection and monitoring

   - Did the contractor identify an Environmental Coordinator? If yes, was the coordinator effective? Explain.
   - Did Hydro provide an Environmental Coordinator?

5. Regulatory compliance

   - Did regulatory agencies inspect project work sites?
   - Have regulatory inspectors initiated, or indicated that they may be initiating, investigations, regulatory orders, administrative penalties, or offence charges related to any work activities? If yes, explain.

6. Rehabilitation

   - Has rehabilitation been completed? If no, explain.

9. Recommendations

List, in bullet form, the recommendations arising from the lessons learned process for this project. Consider recommendations that could be implemented to enhance the delivery of:

- *Future phases of the project (e.g. lessons learned for battery or RTU installations for one site can be applied to the next site;*
- *Future iterations of repeatable projects (e.g. lessons learned from Lotus Notes or JD Edwards upgrade can be applied to the next upgrade); and/or*
- *Other projects (e.g. lessons learned recommendations that are more generally applicable).*

For projects involving the Strategic Partner or any consultant/vendor, identify the recommendations that can assist in the planning and delivery of other projects involving external resources. These recommendations would likely focus on the processes related to engaging the consultant, planning the work and managing the delivery of the project. For example, a recommendation arising from recent partnership projects is the requirement for the partner to initiate the identification of skilled resources 1-2 months in advance of the start date for projects requiring sub-contractor resources (e.g. JDE, Showcase).

10. Approvals

Signatures appearing below indicate a review of the document and approval of the project results as described in this document. The Asset/Business Unit Manager will decide on the positions to sign-off on the Post Implementation Report. If the positions are not listed, then add as required.

Name:		Date:
Title:	Technical Lead	
Name:		Date:
Title:	Asset Manager	
Name:		Date:
Title:	Labour Manager	
Name:		Date:
Title:	Manager T&D (TRO)	
Name:		Date:
Title:	Manager G&T (TRO)	
Name:		Date:
Title:	Project Manager	
Name:		Date:
Title	Project Owner	

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PROJECT TEAM LESSONS LEARNED SURVEY

Guidelines for Project Managers

The purpose of the lessons learned survey is to obtain feedback from a Project Team regarding how a project is proceeding/was conducted and to identify recommendations that can be used to improve the delivery of future projects or subsequent phases of projects.

This survey is intended as a template that should be adapted by Project Managers to reflect the specifics of a project. The survey has been divided into themes or sections with a series of questions relating to that theme. Project Managers are encouraged to add or delete sections and/or individual questions.

This survey can be sent to team members during or after a project but it is suggested that it be sent before any group "lessons learned" meetings. The survey is not intended to collect exhaustive data on every topic area but rather to identify the particular areas that should get special exploration in the group lessons learned meeting. As well, the survey provides an avenue for feedback from team members who may be unable to attend lessons learned meetings or who may not be comfortable offering feedback in that forum. Project Managers may also chose to provide for anonymous feedback by suggesting that team members print and return the survey through internal mail.

When documenting survey results ensure that only summary information is provided; no comments or ratings should be attributed to individuals.

Instructions to Project Teams

The purpose of the survey is to review what happened with this project and to identify what the Project Team and Hydro can learn from what happened.

Please take this opportunity to offer your views on the project. Your feedback will be combined with the feedback of other team members and a summary of the survey results will be prepared; no comments or ratings will be attributed to individuals.

You may forward your completed survey to the Project Manager via email or interoffice mail.

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Section 1: Overall Project Success

Question	Rating				
	5 Very Satisfied	4 Somewhat Satisfied	3 Neutral	2 Dissatisfied	1 Very Dissatisfied
1. How satisfied are you with the project results?					
2. How satisfied are you with the way the project was performed (the process)?					
3. Did the project fulfill **schedule/time** objectives?					
4. Did the project fulfill **budget** objectives?					
5. Did the project deliver agreed **scope**?					
6. How satisfied are you with the quality of the deliverables from the Project?					

For this project, identify key things that were done right and should be continued.

1.
2.
3.

For this project, identify key things that were done wrong or could be improved.

1.
2.
3.

What unusual factors or issues (which might have either positively or negatively affected the project) should be kept in mind when examining the history of this project?

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Section 2: Roles and Responsibilities

Question	Rating				
	5 Very Satisfied	4 Somewhat Satisfied	3 Neutral	2 Dissatisfied	1 Very Dissatisfied
1. How satisfied are you with the explanation of your role in the project?					
2. How satisfied are you with the definition of the roles and responsibilities of other project team members?					
3. How satisfied are you with the performance of Hydro team members on this project?					
4. How satisfied are you with the support provided by the Project Steering Committee?					
5.To what extent did the Project Owner positively impact the project?					
6. How satisfied are you with the explanation of the role of the partner in this project?					
7. How satisfied are you with the way the partner resources performed on this project?					
8. How satisfied are you that the partner satisfied all obligations according to the Statement or Work and Approved Change Request?					

Comments:

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Section 3: Communication and Relationships

Question	Rating				
	5 Very Satisfied	4 Somewhat Satisfied	3 Neutral	2 Dissatisfied	1 Very Dissatisfied
1. How satisfied are you with the effectiveness of project team meetings?					
2. How satisfied are you with how and when the Project was commissioned to your Department?					
3. How satisfied are you that appropriate parties were informed of project status in a timely fashion?					
4. How satisfied are you with the way your efforts were recognized?					
5. How satisfied are you with the way you were involved in project decisions?					
6. How satisfied are you with the responsiveness of the partner during the planning and delivery of the project?					
7. How satisfied are that the entire team was committed to the project schedule?					

Comments:

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Section 4: Project Planning

Question	Rating				
	5 Very Satisfied	4 Somewhat Satisfied	3 Neutral	2 Dissatisfied	1 Very Dissatisfied
1. How satisfied are you with the way the project was defined when it began?					
2. How satisfied are you with the amount of detail in the Microsoft project work plan?					
3. How satisfied are you with that the timing and effort outlined in the Microsoft project work plan was realistic?					
4. How satisfied are you that project phases and checkpoints were adequate for project control?					
5. How satisfied are you with the opportunity you had in developing the project work plan?					

Comments:

Section 5: Technical Approach

Note: Develop questions to reflect the type of project.

Question/Statement	Rating				
	5 Very Satisfied	4 Somewhat Satisfied	3 Neutral	2 Dissatisfied	1 Very Dissatisfied
Satisfaction with:					
1.					
2.					
3.					
4.					
5.					
6.					
7.					
8.					
9.					
10.					

Comments:

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Section 6: Training and Documentation

Question	Rating				
	5 Very Satisfied	4 Somewhat Satisfied	3 Neutral	2 Dissatisfied	1 Very Dissatisfied
1. How satisfied are you with the definition of training/knowledge transfer objectives for the project?					
2. How satisfied are you with the fulfillment of the training/knowledge transfer objectives?					
3. How satisfied are you with project management documents (e.g. Project Charter, Project Plan, Project Change Requests, etc.)?					
4. How satisfied are you with product/service documents (e.g. Requirement and technical specifications; System guides and manuals; as-built documentation)?					

Comments:

Section 7: Other Comments

What were some of the greatest challenges that the project team had to work through?

For the next project, how/what would we improve on the way the project was conducted?

Feel free to add any other comments here:

Thank you for your comments!

APPENDIX A - SAMPLE DISCUSSION QUESTIONS

Overall Project Results

- Were project expectations well defined, managed and met?
- Did the project satisfy the expectations of its owner, sponsors, clients/users?
- What could have been done to have increased the successes and decreased the number of challenges/difficulties on the project?
- Did users consider the project to be on time and of high quality

Roles and Responsibilities

- To what extent did the project team complete their tasks as assigned?
- How well did the project team work together?
- How did the project team contribute to the overall outcome of the project (whether successful or not)?
- What were some of the greatest challenges that the project team had to work through? How did they manage these challenges?
- Did we have/utilize the appropriate resources?
- To what extent did the partner positively impact the project?
- To what extent did the partner negatively impact the project?
- Were the right members included in the project?
- Were the team roles and responsibilities clear?
- To what extent did the Project Owner positively or negatively impact the project?
- Did the clients/users fulfill their responsibilities to provide resources, turnaround approvals in a timely way, take part in work sessions, review and test the product, and provide accurate information?

Communication and Relationships

- Meetings: who/when/how often. How well did this work?
- Communication: who/when/how often. How well did this work?
- Were users/customers regularly updated regarding project status?
- Were project meetings runs productively and efficiently?

Project Planning

- Were project phases well planned and checkpoints adequate for control?
- Who was responsible for original plans? How did that work? Were the right people involved?
- Was the project well defined from the beginning? Was there an actual written plan? Was the Project Plan communicated? How well did that work?
- Was the plan a good one? What was good? What was missing?
- Was the plan realistic?
- How did the plan evolve over time? Was the change good or bad? How did the changes affect the project?
- Was the project activity well coordinated and did things happen according to schedule?

Partner Projects

For projects delivered in partnership with Aliant-xwave, the following points should be discussed and included in the Post Implementation Review:

- Were specific training requirements identified in the project Statement of Work? Was the source of training identified? Was required training delivered?
- Was the approach to identifying and approving project resources successful?
- Project Change Management: Comment on the number of changes in project schedule, scope and budget and any resulting Hydro/Aliant-xwave downtime.
- Were any specific knowledge transfer/best practices requirements identified in the project Statement of Work? Were the requirements addressed?
- Were roles and responsibilities between Hydro and Aliant-xwave understood by the project team? Were the agreed upon roles and responsibilities performed?
- Did vendors adhere to schedule?
- Were vendors cooperative? Flexible?
- Would you recommend the vendors used on this project for future projects?
- Did the partner contribute innovation and value to the project? Discuss why or why not.

Project Management

- Comment on the number and type of changes to project scope, schedule and budget. How were changes tracked, communicated. How well did this work? Were responses to project change requests timely and fair?
- Were the projects managed to minimize operational disruptions, or were project managers unaware of the inconvenience they may cause?
- What risks occurred on the project that were not anticipated? What was learned about risk management that will help with future projects?
- What issues were identified with the project? Were the issues well managed?

Technical Approach

- What did we learn from the technical approach to the project?
- What can be done differently next time?
- What processes should we change?
- Should we try a different technical approach?

Training and Documentation

- Documentation: For technical and project management documentation comment on the completeness and accuracy of documentation; adherence to standards and guidelines for various documents types; adherence to format requirements; technical adequacy; internal consistency throughout documents and understanding for the intended audience.
- Was the requirement for training and/or knowledge transfer clearly documented in the project plan?
- Did the right people receive the right training at the right time?
- What could have been done to improve the training and documentation aspects of the project?

Innovation

- Did the delivery of the project consider improved approaches to meeting stated requirements?
- Describe any innovations used or developed by the project.

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COMMUNICATION PLAN
PROJECT WORK

Communication Planning involves determining the information and communications needs of stakeholders. Who needs what information? When will they need it? How will the information be provided and by when? Identifying the information required by stakeholders and a suitable means of providing that information will increase project success.

Project Name:

Project Number:

Project Date:

Project Classification: ☐ **Operating** ☐ **Capital**

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1. Introduction

All projects require accurate and consistent communication paths between the Project Manager and various groups within the Project. The following document identifies the groups, the type of communication used and the frequency. The plan must be initiated by the Project Manager.

2. Project Information

Project Manager:

Project Supervisor(s):

Team Leader(s):

Team Members:

3. Communication Matrix (Internal & External)

Who needs information?	What information?	How often?	Who provides information?	Communication Medium

4. Communication Plan Approval Signatures

_____ Name: Title:

_____ Name: Title:

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POST IMPLEMENTATION REVIEW REPORT

Project Name:

Project Number:

Project Date:

Project Classification: ☐ **Operating** ☐ **Capital**

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1. Introduction

Project Information

Name of Project:

Project Owner:

Type of Project:

Short Project Description:

Internal Contact Name:

Process

2. Overall Project Evaluation

3. Scope and Deliverables (Quality Analysis)

4. Cost vs. Budget Analysis

Table <#>: Budgeted and Actual Costs

Cost Category (Account Description)	Original Budget	Approved Change Requests	Revised Budget	Actual Costs	Variance
TOTAL					

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5. Schedule Analysis

6. Successes and Challenges

7. Safety Performance

8. Environmental Assessment

9. Recommendations

10. Approvals

Signatures appearing below indicate a review of the document and approval of the project results as described in this document. The Asset/Business Unit Manager will decide on the positions to sign-off on the Post Implementation Report. If the positions are not listed, then add as required.

Name: Date:
Title: Technical Lead

Name: Date:
Title: Asset Manager

Name: Date:
Title: Labour Manager

Name: Date:
Title: Manager T&D (TRO)

Name: Date:
Title: Manager G&T (TRO)

Name: Date:
Title: Project Manager

Name: Date:
Title Project Owner

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PROJECT TEAM LESSONS LEARNED SURVEY

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Instructions to Project Teams

The purpose of the survey is to review what happened with this project and to identify what the Project Team and Hydro can learn from what happened.

Please take this opportunity to offer your views on the project. Your feedback will be combined with the feedback of other team members and a summary of the survey results will be prepared; no comments or ratings will be attributed to individuals.

You may forward your completed survey to the Project Manager via email or interoffice mail.

Newfoundland & Labrador Hydro
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Section 1: Overall Project Success

Question	Rating				
	5 Very Satisfied	4 Somewhat Satisfied	3 Neutral	2 Dissatisfied	1 Very Dissatisfied
1. How satisfied are you with the project results?					
2. How satisfied are you with the way the project was performed (the process)?					
3. Did the project fulfill **schedule/time** objectives?					
4. Did the project fulfill **budget** objectives?					
5. Did the project deliver agreed **scope**?					
6. How satisfied are you with the quality of the deliverables from the Project?					

For this project, identify key things that were done right and should be continued.

1.
2.
3.

For this project, identify key things that were done wrong or could be improved.

1.
2.
3.

What unusual factors or issues (which might have either positively or negatively affected the project) should be kept in mind when examining the history of this project?

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Section 2: Roles and Responsibilities

Question	Rating				
	5 Very Satisfied	4 Somewhat Satisfied	3 Neutral	2 Dissatisfied	1 Very Dissatisfied
1. How satisfied are you with the explanation of your role in the project?					
2. How satisfied are you with the definition of the roles and responsibilities of other project team members?					
3. How satisfied are you with the performance of Hydro team members on this project?					
4. How satisfied are you with the support provided by the Project Steering Committee?					
5.To what extent did the Project Owner positively impact the project?					
6. How satisfied are you with the explanation of the role of the partner in this project?					
7. How satisfied are you with the way the partner resources performed on this project?					
8. How satisfied are you that the partner satisfied all obligations according to the Statement or Work and Approved Change Request?					

Comments:

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Section 3: Communication and Relationships

Question	Rating				
	5 Very Satisfied	4 Somewhat Satisfied	3 Neutral	2 Dissatisfied	1 Very Dissatisfied
1. How satisfied are you with the effectiveness of project team meetings?					
2. How satisfied are you with how and when the Project was commissioned to your Department?					
3. How satisfied are you that appropriate parties were informed of project status in a timely fashion?					
4. How satisfied are you with the way your efforts were recognized?					
5. How satisfied are you with the way you were involved in project decisions?					
6. How satisfied are you with the responsiveness of the partner during the planning and delivery of the project?					
7. How satisfied are that the entire team was committed to the project schedule?					

Comments:

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Section 4: Project Planning

Question	Rating				
	5 Very Satisfied	4 Somewhat Satisfied	3 Neutral	2 Dissatisfied	1 Very Dissatisfied
1. How satisfied are you with the way the project was defined when it began?					
2. How satisfied are you with the amount of detail in the Microsoft project work plan?					
3. How satisfied are you with that the timing and effort outlined in the Microsoft project work plan was realistic?					
4. How satisfied are you that project phases and checkpoints were adequate for project control?					
5. How satisfied are you with the opportunity you had in developing the project work plan?					

Comments:

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Section 5: Technical Approach

Note: Develop questions to reflect the type of project.

Question/Statement	Rating				
	5 Very Satisfied	4 Somewhat Satisfied	3 Neutral	2 Dissatisfied	1 Very Dissatisfied
Satisfaction with:					
1.					
2.					
3.					
4.					
5.					
6.					
7.					
8.					
9.					
10.					

Comments:

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Section 6: Training and Documentation

Question	Rating				
	5 Very Satisfied	4 Somewhat Satisfied	3 Neutral	2 Dissatisfied	1 Very Dissatisfied
1. How satisfied are you with the definition of training/knowledge transfer objectives for the project?					
2. How satisfied are you with the fulfillment of the training/knowledge transfer objectives?					
3. How satisfied are you with project management documents (e.g. Project Charter, Project Plan, Project Change Requests, etc.)?					
4. How satisfied are you with product/service documents (e.g. Requirement and technical specifications; System guides and manuals; as-built documentation)?					

Comments:

Section 7: Other Comments

What were some of the greatest challenges that the project team had to work through?

For the next project, how/what would we improve on the way the project was conducted?

Feel free to add any other comments here:

Thank you for your comments!

APPENDIX A - SAMPLE DISCUSSION QUESTIONS

Overall Project Results

- Were project expectations well defined, managed and met?
- Did the project satisfy the expectations of its owner, sponsors, clients/users?
- What could have been done to have increased the successes and decreased the number of challenges/difficulties on the project?
- Did users consider the project to be on time and of high quality

Roles and Responsibilities

- To what extent did the project team complete their tasks as assigned?
- How well did the project team work together?
- How did the project team contribute to the overall outcome of the project (whether successful or not)?
- What were some of the greatest challenges that the project team had to work through? How did they manage these challenges?
- Did we have/utilize the appropriate resources?
- To what extent did the partner positively impact the project?
- To what extent did the partner negatively impact the project?
- Were the right members included in the project?
- Were the team roles and responsibilities clear?
- To what extent did the Project Owner positively or negatively impact the project?
- Did the clients/users fulfill their responsibilities to provide resources, turnaround approvals in a timely way, take part in work sessions, review and test the product, and provide accurate information?

Communication and Relationships

- Meetings: who/when/how often. How well did this work?
- Communication: who/when/how often. How well did this work?
- Were users/customers regularly updated regarding project status?
- Were project meetings runs productively and efficiently?

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Project Planning

- Were project phases well planned and checkpoints adequate for control?
- Who was responsible for original plans? How did that work? Were the right people involved?
- Was the project well defined from the beginning? Was there an actual written plan? Was the Project Plan communicated? How well did that work?
- Was the plan a good one? What was good? What was missing?
- Was the plan realistic?
- How did the plan evolve over time? Was the change good or bad? How did the changes affect the project?
- Was the project activity well coordinated and did things happen according to schedule?

Partner Projects

For projects delivered in partnership with Aliant-xwave, the following points should be discussed and included in the Post Implementation Review:

- Were specific training requirements identified in the project Statement of Work? Was the source of training identified? Was required training delivered?
- Was the approach to identifying and approving project resources successful?
- Project Change Management: Comment on the number of changes in project schedule, scope and budget and any resulting Hydro/Aliant-xwave downtime.
- Were any specific knowledge transfer/best practices requirements identified in the project Statement of Work? Were the requirements addressed?
- Were roles and responsibilities between Hydro and Aliant-xwave understood by the project team? Were the agreed upon roles and responsibilities performed?
- Did vendors adhere to schedule?
- Were vendors cooperative? Flexible?
- Would you recommend the vendors used on this project for future projects?
- Did the partner contribute innovation and value to the project? Discuss why or why not.

Project Management

- Comment on the number and type of changes to project scope, schedule and budget. How were changes tracked, communicated. How well did this work? Were responses to project change requests timely and fair?
- Were the projects managed to minimize operational disruptions, or were project managers unaware of the inconvenience they may cause?
- What risks occurred on the project that were not anticipated? What was learned about risk management that will help with future projects?
- What issues were identified with the project? Were the issues well managed?

Technical Approach

- What did we learn from the technical approach to the project?
- What can be done differently next time?
- What processes should we change?
- Should we try a different technical approach?

Training and Documentation

- Documentation: For technical and project management documentation comment on the completeness and accuracy of documentation; adherence to standards and guidelines for various documents types; adherence to format requirements; technical adequacy; internal consistency throughout documents and understanding for the intended audience.
- Was the requirement for training and/or knowledge transfer clearly documented in the project plan?
- Did the right people receive the right training at the right time?
- What could have been done to improve the training and documentation aspects of the project?

Innovation

- Did the delivery of the project consider improved approaches to meeting stated requirements?
- Describe any innovations used or developed by the project.

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COMMUNICATION PLAN
PROJECT WORK

Communication Planning involves determining the information and communications needs of stakeholders. Who needs what information? When will they need it? How will the information be provided and by when? Identifying the information required by stakeholders and a suitable means of providing that information will increase project success.

Project Name:

Project Number:

Project Date:

Project Classification: ☐ **Operating** ☐ **Capital**

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1. Introduction

All projects require accurate and consistent communication paths between the Project Manager and various groups within the Project. The following document identifies the groups, the type of communication used and the frequency. The plan must be initiated by the Project Manager.

2. Project Information

Project Manger:

Project Supervisor(s):

Team Leader(s):

Team Members:

3. Communication Matrix (Internal & External)

Who needs information?	What information?	How often?	Who provides information?	Communication Medium

4. Communication Plan Approval Signatures

_____ _____

Name: Name:
Title: Title:

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J D EDWARDS
WORK REQUESTS / WORK ORDERS

1. **What is a Work Request?**

   A request to do work. The request simply describes the work that needs to be done, identifies the location of the work, and the piece of equipment or system that the work is required on.

2. **How do I initiate the Work Request?**

   If you have been trained in the JD Edwards Maintenance Module and you have access to a computer, you can simply initiate the Work Request yourself. If you are not familiar with JD Edwards and Work Requests, should contact the appropriate Regional Planning Department, a Control Room or a Control Centre and give them the Work Request information and ask them to generate the request. Provide your name in case extra information is required.

3. **What happens to the Work Request?**

   An Asset/Business Unit Manager reviews the request. If the Manager doesn't see a need for the work, it will be rejected and the reason communicated to the originator. If it is accepted, it will be prioritized and approved, making it an official Work Order.

4. **What is a Work Order?**

   An approved work request used to request, plan, schedule, track and report on a work activity.

5. **What type of work do we use Work Orders for?**

   In core business we use work orders for all work that require internal resources (people, equipment, material etc). Work orders are required for the five types of work (corrective, preventive, non-maintenance, operating and capital projects.

6. **What is the purpose of Work Orders?**

The Work Order system provides the most highly leveraged tool a maintenance force can possess. Work Orders have many useful purposes:

- To identify, prioritize, keep track off and manage the execution of work.
- To identify resources (labour, material, tools, etc.).
- To track and manage cost.
- To track and manage work.
- To procure goods and services.
- To capture equipment history.
- To organize work into different status categories (status flows).
- To plan and schedule work.
- To link cost and Work Order history to assets.
- To build resource plans.
- To manage backlog.
- To gather data and analyze equipment failures.
- Capacity to drill into Work Orders to explain unacceptable budget variances.
- Work Order information can be used for future identical or similar jobs.
- Great for comparing estimates/actuals/budgets, etc.
- Using JD Edwards Work Order system provides corporate visibility.

7. **Are we presently using Work Orders for operating and capital project work?**

Unfortunately, it is an area where Work Orders receive minimal use.

8. **Should the corporation be using Work Orders for operating and capital project work? Why?**

Yes, we should be using Work Orders for all work including operating and capital project work, for all the reasons listed above (in Questions 6).

9. **We have been managing project work for years without Work Orders. Why do we need to use Work Orders now?**

Today budgets, cash flow sheets, schedules and on-site supervision is used to manage and control project work. These tools will still be used but we need to interface these tools with the Work Order system so we can also take advantage of the benefits the Work Order has to offer.

10. **Since Work Orders are going to be used for operating and capital projects, where do I as Project Engineer or Project Manager begin?**

In future, capital and operating projects will be approved 6-12 months in advance of execution. The plan will contain valuable information such as project objectives, project work breakdown structure, project schedule, resource plan, etc. When the plan has been reviewed and signed-off on by customer, the Work Order set up can begin.

11. **What is my role as Project Manager in Work Order set up?**

Your role as Project Manager at this stage is to engage the Regional Planning Department in the Work Order set up process. As a team you will determine the number of Work Orders required to manage and control the execution of the project. The number of Work Orders will be closely linked to the high level activity listing in the work breakdown structure.

12. **Do I as Project Manager need to input the Work Order and all applicable work order information, i.e. labour by craft, material, etc.?**

It is important to know how to create Work Orders, add parts and labour, etc., but if there are multiple Work Orders with lengthy parts lists, etc., the Regional Planning Department will assist.

13. **What training do I as Project Manager need to become proficient in JD Edwards?**

JD Edwards training for engineers, project managers and project engineers is the responsibility of the applicable manager/director. Execution of JD Edwards training is not the responsibility of the Work Execution Process Team but identifying JD Edwards training objectives for Work Execution participants is within our mandate.

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JD Edwards Basic Training

Participants must know:

1. How to create a Work Request.
2. How to add crafts to a Work Order.
3. How to add parts to a Work Order.
4. How to add account code structure to a Work Order.
5. How to locate and select asset number to a Work Order.
6. Five types of Work Orders and their number designations.
7. How to create an operating and capital project Work Order (procedure).
8. Work Order status flows.
9. How to do job status inquiry.
10. How to find work orders using different search prompts, i.e. department, planner, organization, asset number, work order status, etc.
11. How to do a Work Order backlog inquiry.
12. How to use cost by work order screen.
13. How to use job status inquiry screen.
14. How to do inventory search.
15. How to do a parts status inquiry.
16. How to find commodity codes for non-stock items.
17 How to view/enter on-line requisition entry.
18. How to set up 8-digit stock number (goods and services procedure).
19. Code of account structure for operating and capital.
20. How to do T1 budget entry.
21. How to do an account balance inquiry.
22. Other financial inquiries.