

1 Q. Please provide Hydro's procedure for forced outage reporting and subsequent investigation
2 into the cause(s) of the forced outage.

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5 A. Please refer to PUB-NLH-039, Attachment 1: "Hydro Generation Standing Instruction No.
6 62: Forced Outage Reporting, Investigation and Trending," Revision 2, September 7, 2017.

NEWFOUNDLAND AND LABRADOR HYDRO
HYDRO GENERATION
STANDING INSTRUCTION

S.I. NO. 62

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ISSUE DATE: February 2, 2010
REVIEW DATE: September 7, 2017
ISSUED BY: B. Woodman / P. Winsor
REVISION DATE: September 7, 2017
APPROVED BY: L. Kearley / P. Robbins

Revision: 2

SUBJECT: FORCED OUTAGE REPORTING, INVESTIGATION AND TRENDING

POLICY STATEMENT

All forced outages, forced deratings and under-frequency events on Generating Units shall be reported and investigated. The reporting is used to establish a benchmark to measure forced outage performance and the investigation is required to determine root causes and prevention of future incidents.

INTRODUCTION

Unit availability is one of the benchmarks used to determine maintenance and operational effectiveness. NL Hydro is required to have generating units available to meet customer electricity demand at all times. Forced outages, deratings and under-frequency events are unacceptable and as a result these outages must be investigated to determine the root causes and subsequently establish remedial actions to prevent future occurrences.

CEA Forced Outage and De-rating definitions

Refer to CEA Equipment Status (Blue Book) for CEA definitions.

RESPONSIBILITIES

Operator:

- Take necessary action to deal with the outage. Consult with Operations Supervisor during regular hours or On-Call Supervisor outside of regular hours to report the issue and share all available information relating to the issue.
- Initiate a Work Order to capture details of the outage after outage response work has been dealt with. Contact the Operations supervisor or the on-call supervisor to input the work order if the plant does not have computer access.
- Input information into the GES database. Document all applicable information associated with the outage using the “**Outage Data Support Form**”; including the forced outage investigation Work Order number (if available).
- Fax or email the “Outage Data Support Sheet” to the following in the a.m. of next working day:
 - Operations Supervisor
 - Operations Manager

Operations Supervisor and On-Call Supervisor :

The operations supervisor will be responsible for these roles during normal working hours, and the on-call supervisor will perform this role outside normal working hours

- Responsible for consulting with the Energy Control Centre to determine system requirement for the unit and the schedule to be worked to meet that requirement.
- Notify the Manager of the forced outage. Communicate to a broader group as applicable (send email to the “Morning email group” to notify of the outage and update expected return to service as applicable).
- Ensure the outage data support sheet is completed by Operations and work order is entered.
- Start the first draft of the outage investigation report. Pass over updating responsibility of this document to the lead investigator when assigned.

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Operations supervisor only:

- Review the data documented on the Outage Data Support Sheet and the JDE Work Order.
- Provide a copy of the original Outage Data Support Sheet in pdf format to the Operations Manager.
- Verify that GES information is entered correctly in consultation with the Senior System Reliability Engineer.
- Assume role as lead forced outage investigator for Class 3 forced outages and prepare the formal forced outage report for these outages.
- Generate work orders for remedial actions and investigative work for Class 3 outages. These are to be child work orders to the original work order created by the Operator. Ensure work orders are tagged with Failure Code.
- Assign remedial actions using the Outage Remedial Actions Tracking database for Class 3 outages (*located on the GRID*).

Operations Manager:

- Discuss initial findings with Operations Supervisor/On-call Supervisor and identify immediate impacts to overall system reliability. Develop a short term operational action plan as required.
- Liaisons with ECC regarding system reliability to ensure immediate actions are taken to mitigate identified risks.
- Update the Manager and General Manager of the outage and of the investigation progress daily until the unit is returned to service. Communicate to a broader group as applicable.
- Ensure that work orders are tagged with all applicable sub codes (WNR, WNB, FOD, and OT codes as applicable).
- Attend monthly Generation Performance meeting.
- Support the forced outage investigation process.

LTAP Manager:

- Assume role as lead forced outage investigator for Class 1 and 2 forced outages and prepare the formal forced outage report for these outages.
- Generate work orders for remedial actions and investigative work. These are to be child work orders to the original work order created by the Operator. Ensure work orders are tagged with Failure Code.
- Assign remedial actions using the Outage Remedial Actions Tracking database (*located on the GRID*).
- Schedule and chair monthly Generation Performance meetings.
- Follow-up on completed remedial actions to ensure they are effective and meet intent. Report on overdue action items at the monthly Generation Performance meeting.
- Review and report on forced outage history semi-annually, looking for trends and repeat issues.

Work Execution Manager:

- Provide resources to participate in troubleshooting activities and support the urgent nature for the planning and execution of forced outage work orders.
- Support the forced outage investigation process.

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FORCED OUTAGE CLASSIFICATIONS

Class	Description	Examples	Lead investigator
1	Causes an interruption to customers.	- Under Frequency Load Shedding. - Results in an inability to meet system reserves.	LTAP
2	Equipment failure requiring a detailed tech. analysis for root causes and/or remedial actions.	- Unexplained protection trips. - Repeat failures of components (PLC cards, governor press. switches).	LTAP
3	All other forced outages.	- External causes. - Protection operated as designed (shear pins, lightning). - Obvious human error.	Operations Supervisor

TIMING:

- The troubleshooting portion of the forced outage investigation must be started upon notification of the forced outage.
- The on-call supervisor/operations supervisor is responsible for initiating the outage investigation report upon notification of the forced outage and is to update this report daily until a lead investigator has been assigned or the outage is over.
- The lead investigator is responsible for the formal forced outage report. Report is to be initiated the first working day after the outage. Initial draft report is to be submitted 5 days after outage.
- Determine the requirement for a root cause analysis (RCA) within 3 working days after the forced outage. If required, Root Cause Analysis to start within 7 days of the outage by an assigned team. The first draft of the formal Root Cause Analysis report shall be completed within 5 working days of completion of the Root Cause Analysis investigation.
- Management Team ensures annual review of standard is conducted and updates are shared appropriately.

TOOLS:

- Outage Investigation Report Template
- Forced Outage Database
- Outage Remedial Actions Tracking database (*located on the GRID*)
- Outage Data Support Form
- SCAT Chart
- Tap Root
- Formal Forced Outage Report Template