Q. (Reference Application, 1.1 Distribution Reliability Initiative, pages 4 and 5) It is stated "*Long duration outages on this section are primarily due to equipment failures and danger tree contacts*."

a) Is historical reliability performance a useful input to a decision to upgrade a feeder?

b) Does the above statement suggest that NP's tree trimming and vegetation management programs are inadequate?

c) What additional actions could be taken by NP to reduce or eliminate danger tree contacts?

d) If NP were to take action to reduce the impact of danger tree contacts, how would that impact the reliability statistics shown in Table 2 (page 5), and at what cost?

e) If the line is relocated as proposed, will danger tree contacts be eliminated?

f) Please file for the record copies of NP's tree trimming and vegetation management programs.

A. a) Historical reliability performance is the primary input to a decision to upgrade one of the Company's worst performing feeders. The *Distribution Reliability Initiative* project involves: (i) calculating reliability performance indices for all feeders; (ii) analyzing the reliability data for the worst performing feeders to identify the cause of the poor reliability performance; and (iii) completing engineering assessments for those feeders where poor reliability performance cannot be directly related to isolated events that have already been addressed.

b) The above statement does not suggest that Newfoundland Power's tree trimming and vegetation management programs are inadequate. A danger tree is any tree on or off the right-of-way that could contact a distribution or transmission line.[1] While danger trees on the right-of-way can be addressed through vegetation management, danger trees off the right-of-way may involve getting permission to remove the tree from the property owner. Danger tree deficiencies are identified through routine distribution feeder inspections.

c) To eliminate danger tree contacts entirely, Newfoundland Power would have to widen all of its easements associated with distribution and transmission rights-of-way to the point where adjacent wooded areas would be far enough away from the conductor that if it were to fall towards the line, it would not make contact. The cost of obtaining and maintaining such larger right-of-ways would be prohibitive, and is not standard utility practice.

The use of technology provides other opportunities to reduce the impact of danger tree contacts. For example, the use of aerial drones to assess the condition of the

[1] Per Newfoundland Power's Operating Procedure OPR101.24, for a tree to be considered a danger tree, it will generally have demonstrable weaknesses or flaws and have an imminent potential for failure. Upon failure, the tree (or a branch or limb of the tree) must have potential to fall onto, come in contact with, come in close proximity to a live electrical conductor, or otherwise damage the Newfoundland Power transmission or distribution system or it must be a danger to the public. Also, a danger tree is a live, healthy tree that, once cut, has the potential to contact, or come in close proximity to, a live electrical conductor.

right-of-way could improve the identification of danger trees. Also, the use of satellite technology has the potential to identify conditions on and adjacent to the right-of-way. Newfoundland Power will consider the availability of technology to improve operations while providing efficiency benefits.

d) Table 1 is a revised version of report *1.1 Distribution Reliability Initiative*, page 5, Table 2, with the impact of danger tree contacts on the reliability statistics for the distribution of feeder WAV-01 downstream of WAV-01-R2 removed.

Table 1
Revised Distribution Interruption Statistics
Three-Year Average to December 31, 2022

Feeder Section	Customer Minutes of Outage	SAIFI	SAIDI
Downstream WAV-01-R2[2]	152,639	2.98	3.92
Corporate Average (Five-Year)	96,188	1.40	1.87

Report *1.1 Distribution Reliability Initiative* outlines Alternative 1, which involves rebuilding the 4.8-kilometre three-phase section of WAV-01 feeder in the existing right-of-way from Long Cove to Thornlea. This would include replacing all deteriorated poles and crossarms, and upgrading the primary conductor to standard 4/0 AASC. The existing right-of-way would also be widened as required to prevent tree contacts from danger trees outside of the existing right-of-way. The total capital cost of Alternative 1 is $1,027,000, which was $127,000 more than Alternative 2, which involved relocating the line to the road right-of-way.

e) If the line is relocated to the road right-of-way as proposed, there would be fewer danger tree contacts than what is experienced in the current off-road location. In the road right-of-way, there are only mature trees on one side of the distribution line.

f) Newfoundland Power's tree trimming and vegetation management programs are included in its *Distribution Inspection and Maintenance Practices* included as Attachment A.

[2] The reliability data for distribution feeder WAV-01 downstream of WAV-01-R2 is provided by the Company's Outage Management System. This data is only available for the three years since 2019. As a result, the reliability data here is different from the five-year average data provided in Table 1.

ATTACHMENT A:

Newfoundland Power Distribution Inspection and Maintenance Practices

NEWFOUNDLAND POWER
A FORTIS COMPANY

DISTRIBUTION INSPECTION AND MAINTENANCE PRACTICES

Approved By:	Byron Chubbs, P. Eng.
Approved Date:	March 4, 2013
Revised By:	M. R. Murphy, P. Eng.
Revision Date:	December 11, 2017

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DISTRIBUTION INSPECTION AND MAINTENANCE PRACTICES

Policy Statement

Scheduled inspection and maintenance procedures shall be undertaken on all distribution lines. The inspection and repair process is intended to ensure safe and reliable operation. Regional Directors are ultimately responsible to ensure that distribution line inspection and maintenance activities are completed in accordance with this policy in their respective regions.

Public & Employee Safety

The Company owns and operates in excess of 9,000 km of distribution line in both rural and urban environments. Distribution line corridors may be used as trail-ways for snowmobile operators, ATV operators, skiers, hikers and others and are also regularly used by employees to carry out maintenance activities. Distribution lines and distribution rights-of-ways must be inspected and maintained in a manner that assures the safety of the public.

Regular inspections of distribution lines and timely repair of identified deficiencies will minimize risk to the public and employees. Those conducting distribution line inspections have the responsibility to inspect lines thoroughly with a keen focus on identifying potential public and employee safety hazards. Regional Directors, Managers of Operations and Supervisors responsible for maintenance have the shared responsibility to ensure that inspections are completed and any identified deficiencies and hazards are corrected in accordance with this policy.

Inspection Type and Frequency

All overhead primary distribution lines are required to have a minimum of one detailed ground inspection every seven years. However, Managers of Area Operations have the discretion to have more frequent inspections done if time and manpower allow.

Distribution Vegetation Management requires that distribution lines are inspected, on average, every three and a half years for brush clearing and tree trimming. These inspections will be completed as part of the distribution line inspection every seven years, and as a drive-by inspection once in between.

Pad mount transformers are to be inspected annually. These inspections should be completed at the same time as the detailed ground inspection or vegetation inspection if they are required during the same year.

Inspector Qualifications

To inspect Newfoundland Power distribution lines, an inspector must have the following minimum qualifications:

- Minimum 3 years of experience in the electrical utility industry in the operations or engineering area.
- Familiarity with the operation, maintenance and construction of utility lines.
- Familiarity with the use and operation of ATV's and snowmobiles.
- Basic understanding of the electrical and mechanical nature of utility lines.

Distribution Asset Management System

All distribution line preventative maintenance and inspections as well as deficiency identification and corrective maintenance activities shall be recorded in the Company's computerized asset management system known as Avantis.

The Information Systems and Regional Operations groups are responsible for administering Avantis and for training users. Maintenance Supervisors, Schedulers, Planners, Line Supervisors, Managers, and others within the Regional Operations group may have access to this system.

In addition to the software package, there are a number of business processes that detail the responsibilities and handoffs for each step in the asset management system. They can be found on Webster under the Regional Operations department in the Asset Management folder.

Distribution Line Inspections (7 Year Cycle)

Guidelines for detailed ground inspections of distribution lines and the associated record-keeping procedures are as follows:

- Personnel performing inspections shall use the necessary equipment to assist in the evaluation of distribution line components. For example, a hand held computer, binoculars, plumb bob, hammer, core sampler, screwdriver, crescent wrench, and digital camera may be needed.
- Inspection personnel shall assign a Maintenance Priority for each deficiency identified. This priority shall establish when corrective action is required (more information on assigning priority is given in Appendix A - Deficiency Reference Tables).
- Reasonable judgment is required in determining if something should be recorded as a deficiency. Each structure must be analyzed from the perspectives of Public Safety,

Employee Safety, Reliability and Environment to determine if action is warranted. For example;

- It is not the intent to bring all existing plant up to the current construction standards. Simply because a structure is not built to the latest construction standard does not mean it is deficient.

- It is not the intent to record every minor deficiency. For example, if the inspector determines that a minor chip in a pole does not undermine the strength of the pole and poses no danger to public or employee safety, reliability or environment, then it should not be entered into the maintenance system as a deficiency.

Distribution Vegetation Management Inspections (7 Year Cycle)

A distribution line shall have a vegetation inspection completed twice every seven years. This inspection shall be completed as part of the distribution line ground inspection every seven years, and as a drive by inspection once in between. The inspection should be documented on Hand Held Devices.

A vegetation deficiency can be one of two types. (1) A brush clearing deficiency which requires the entire width of the right of way to be cleared. A single brush clearing deficiency may cover an area several kilometers long. (2) A tree trimming deficiency in which a single tree or several trees at the same location are contacting or are in danger of contacting the line and will need to be trimmed. Each tree or small group of trees at the same location is considered a single deficiency.

To assign a priority to the vegetation deficiency, the inspector must take into consideration the details of the vegetation growth, as well as the following:

- Public and employee safety

- The physical location of the line (populated or remote area, near existing roadways or cross-country, etc.)

- The anticipated growth rate (depending on the type of vegetation)

Padmount Transformer Inspections (Annual)

Padmount transformers shall be inspected at least once per year and maintenance to the transformer completed in a timely manner. The inspection should be documented on Hand Held Devices.

This is a visual inspection only.

Appropriate Personal Protective Equipment is to be worn at all times.

Distribution Line Component Inspection Guidelines

Distribution line inspections require evaluation of the following components. For each component there are guidelines to follow during inspections. These guidelines do not cover all possible deficiencies that may exist on each component, and reasonable judgement must be used by the Planner in identifying and prioritizing deficiencies.

Structures

Wood Poles:

During each distribution line inspection, all wood poles require a detailed visual inspection. Depending on the results of the visual inspection a sounding test may be performed. If the visual inspection and/or the sounding test indicate a problem, a core-sampling test may be performed to aid in the evaluation of the pole.

- Inspect and determine condition of pole at ground line and above for rotting, deterioration, splitting, cracks, breaks, burns, woodpecker holes, insect infestation and plumbness.
- Ensure pole is properly backfilled and not undermined.
- Where applicable, inspect condition of crib timber. Ensure crib is properly rock filled.
- Check structure for plumbness or any degree of misalignment.
- Check for structure number tags.
- Ensure that pole grounds are installed on all poles with transformers on them. Ensure that it is rigidly supported, it has not been cut and a ground guard is present and secured

Steel Towers:

- Inspect tower for damaged or missing members. Check member connections for loose or missing nuts and bolts. Check members for buckling.
- Inspect tower for corrosion. Check tower for plumb and any degree of misalignment. Check for structure number tags.
- Inspect backfill conditions around tower footings and legs. Check footing for deterioration. Inspect foundation for surface cracks or splitting. Check that reinforcing is not exposed. Inspect anchor bolts for cracks, rusting or missing anchor nuts.
- Check tower for missing or damaged Danger Signs. Ensure that signs are clearly visible. Check condition of anti-climbing barriers. Anti-climbing barriers and warning signs should be installed on all steel towers. It is a significant public safety issue for barriers or signs to be missing and the deficiency should be classified as a TD1.

Hardware

Cross Arms and Braces:

- Inspect crossarms for rot, splits, cracks and twisting that may cause the conductor to fall to the ground. Also, inspect for burn marks.
- Check that cross arms or braces aren't loose, broken or hanging.

Platforms:

- Check that platform brace isn't loose, broken or hanging.
- Check that platform deck isn't failing or sagging.

Anchors and Guys:

- Inspect guys and pre-formed grips for wear, breaks, slackness and corrosion.
- Ensure guy guards are secure and installed on every guy wire. A missing guy guard is a significant public safety issue and should be classified as high priority.
- Inspect anchor rod and backfill conditions. Check for anchor rod damage. Ensure anchor is not undermined or pulling. Ensure that anchor eye is above ground level.
- Check that all guys are either insulated or effectively grounded to neutral/ground wire.
- Any anchor rods with no guy attached should be identified as a high priority work order if the guy is required or cut off by the planner on-site if the guy is not required.

Insulators

Polymer Type:

- Inspect for broken, split, misaligned, flashed or defective insulators
- Check non dead-end insulators for uplift
- Check that stand off brackets aren't twisted, delaminated or broken

Porcelain Type:

- Inspect for broken, cracked, chipped, misaligned, flashed or defective insulators.
- Check non dead-end insulators for uplift.
- Check that stand off brackets aren't twisted, delaminated or broken
- 2-piece and 8080 insulators should be identified for removal. If they are damaged they should be given a high priority.

Conductor

Primary and Neutral Conductors:

- Check for excessive sag that could result in phases slapping together. Also check for too much tension that could result in vibration induced problems such as broken ties, insulators, or conductor breaks.
- Inspect conductors for safe clearances from buildings, roads, ground, and other power/communication lines.
- Inspect conductor for broken or frayed strands, burn marks, foreign objects.
- Inspect splices for abnormal condition.
- Inspect dead-end assemblies for any abnormal condition.
- Where required, inspect for damaged or missing conductor warning markers.
- Check that tie wires or clamps are not loose or broken.
- Automatic splices, or quick sleeves, should be identified for removal.

Stirrups/Leads/Primary Connections:

- Check hardware for any visible deficiency that may result in conductor falling to the ground.
- Check for broken or corroded conductor near connections.
- Check leads for excessive length.
- Visually inspect conductor around hot line clamps for corrosion and broken strands.

Underground Cables/Conduit/Guards:

- Inspect cable and pothead for damage.
- Check for bad connections.
- Ensure guards are present and secured and grounded as required.

Primary Devices

Pole Mounted Transformers:

- Inspect transformers for rust and leaks. Transformers that are leaking or are rusted to the point that a leak appears imminent must be replaced immediately.
- Ensure that all transformers have PCB identification tags installed (Yellow, Green or White). Particularly, transformers in Protected Public Water Supply Areas contain a green or white PCB identification tag. If no tag is installed then the transformer oil

must be tested. Ensure to note transformer number, civic address, and addresses of customers fed off of transformers to be PCB tested.

- Check for cracked or broken bushings.
- Check for proper tank ground. Each tank is to have a minimum of two independent paths to ground.
- Check that secondary leads aren't rubbing against bottom rim of tank.
- Check for blown fuses.
- Check that animal/bird guards are properly installed and aren't broken or hanging off.
- 25 kVA and 50 kVA unpainted stainless steel ABB transformers without reinforcing brackets shall be identified to have reinforcing brackets installed.
- Transformers with pole mounting brackets showing signs of bending or splitting shall be replaced immediately. Transformers with known design flaws but are not currently exhibiting signs of failure shall be noted for future support bracket installation. Ensure to note if the transformer is located in a sensitive location such as school yard or other high traffic area.

Metering Tanks:

- Inspect tanks for rust and leaks.
- Check for cracked or broken bushings.
- Check for proper tank ground.
- Check that secondary leads aren't rubbing against bottom rim of tank.

Lightning Arrestors:

- Check that Lightning Arrestors (LA) are installed. LA's should be installed on distribution transformers if there is any other reason to climb or otherwise work the pole above ground level. In addition LA's should be installed on all underground dip poles, and on all equipment such as down line reclosers, regulators, and sectionalizers.
- Inspect for broken, cracked, chipped, misaligned, flashed or defective insulators.
- Checked that lightning arrestor has not failed.

Capacitors:

- Inspect tanks for rust and leaks.
- Check for cracked or broken bushings.
- Check for proper tank ground.
- Check for blown fuses.

Switches

Cutouts:

- Ensure disconnects are correctly labeled.
- Check that Current Limiting Fuses (CLF) are installed as required. This includes;
    - All cutouts where fault levels are greater than 10,000 Amps.
    - On cutouts protecting distribution transformers where fault levels are greater than 5,000 Amps and less than 10,000 Amps.
    - On cutouts protecting distribution transformers that are located in proximity to areas where the public is known to gather (e.g. near bus stops, near play ground equipment, etc.) where fault levels are greater than 3,000 Amps but less than 5,000 Amps.
- All porcelain cutouts, except on individual transformers, shall be identified for replacement.

In-Line Switches:

- Ensure disconnects are correctly labeled.
- Ensure blades are in fully open or closed position.
- Check insulators for deterioration or damage.

Gang Operated Switches:

- Ensure disconnects are correctly labeled.
- Check switch for signs of tampering. Check locks and locking mechanism are intact and secure. Gang-operated switches in areas readily accessible to the public are required to be double-locked. Inspect switch handle, pipe, etc. for damage and proper alignment. Inspect all ground connections for tightness, corrosion and damage.
- Check that the switch blades are in the fully open or the fully closed position as per its normal configuration.
- Inspect Insulators for damage.
- Ensure ground mat has not been disturbed. Check for missing or damaged danger signs. Ensure that signs are clearly visible.

Vegetation and Right of Way

To assign a priority to the vegetation deficiency, the inspector must take into consideration the details of the vegetation growth, as well as the following

- Public and employee safety.

- The physical location of the line (populated or remote area, near existing roadways or cross-country, etc.).

- The anticipated growth rate (depending on the type of vegetation).

Brush Clearing:

- Check condition of vegetation growth along right-of-way.

- When recording a brush clearing vegetation deficiency, be sure to record information on the type of brush to be cleared (deciduous or coniferous), the density of brush to be cleared (Light, Medium, Heavy), the average height of the brush, and the start and end points of the section on line requiring brush clearing.

- Check for danger trees that may contact the conductor or trees close to the line that can be easily climbed. Remember that a persons weight on a weak branch could cause it to deflect enough to contact the line.

Tree Trimming:

Public Safety and Reliability are important factors in determining the priority of the danger tree deficiency. When recording a danger tree deficiency, it is important to make the following considerations:

- Whether the tree is in close proximity to the energized high-voltage conductors such that it may make contact. Consider that a branch may swing or bend into the line due to the weight of a climber, wind or buildup of snow or ice.

- Whether the tree is easily accessed from the ground and climbable.

- Whether individuals who are possibly interested in climbing the tree frequently visit the site that the tree occupies.

Encroachments:

- Check for encroachments by foreign structures, unauthorized excavation or fill areas, etc. These should be identified as a deficiency if the Planner judges them to be a public safety hazard.

Distribution Padmount Transformer Inspection Guidelines

Distribution padmount transformer inspections require evaluation of the following components. For each component there are guidelines to follow during inspections. These guidelines do not cover all possible deficiencies that may exist on each component.

Exterior

- Ensure the company number is present and consistent with the Avantis hierarchy

- Check for deficiencies in the door and locking mechanism.

- If there is no danger sticker present, install one.
- Check for signs of oil leaks and severe rusting. Less severe rusting that will not lead to failure within the next year should not be noted as a deficiency.
- Check for proper placement of the padmount transformer on the pad.
- Ensure a snow marker is installed on the unit where required.
- Check for a PCB label. If the label is missing but the PCB content can be found from the nameplate or a test sticker on the interior, apply the appropriate label.
- Check for problems with the foundation, fences or posts and remove any debris from inside. Note any vegetation control required.

Hardware

- Replace any missing bolts and broken locks.
- Check for test caps on the load break elbows.
- Ensure fault indicator is present and reset.

Nameplate

- Verify inclusion and completeness of nameplate information in the handheld.

Bushings

- Ensure the primary and secondary bushings are not damaged.

Connections

- Check condition of all primary and secondary connections. Make note of any visible damage or bonding requirements.

Lightning Arrestors

- Check for lightning arrestors on the primary dip pole.

Typically any transformer removed from service that is greater than 30 years old, requiring painting or testing, should be handed over directly to the waste disposal contractor for scrapping. Units less than 30 years old should be shipped to the Electrical Maintenance Centre for refurbishment if in good condition, and if

- Leaking
- PCB status uncertain
- Involved in an insurance claim

It should also be noted on the work orders that padmounts being scrapped directly from the field should have their nameplates removed and the company number of the padmount written on the back of the nameplate. Nameplates should then be shipped to the EMC.

Also, any units being shipped to the EMC should be tagged with removal details including who removed the padmount from service, where it was previously installed, removal date and reasons why the unit was removed from service.

Communications Plant Inspections - Bell

As part of a distribution line inspection it is required to also inspect any communication equipment belonging to Bell Canada on joint use poles. It is not required to prioritize these deficiencies but anything that in the Planner's judgment is an emergency should be noted and reported as such. Plant belonging to other communication providers are not required to be inspected. Pole and anchor deficiencies in Bell's pole setting areas should follow the existing process for this type of work.

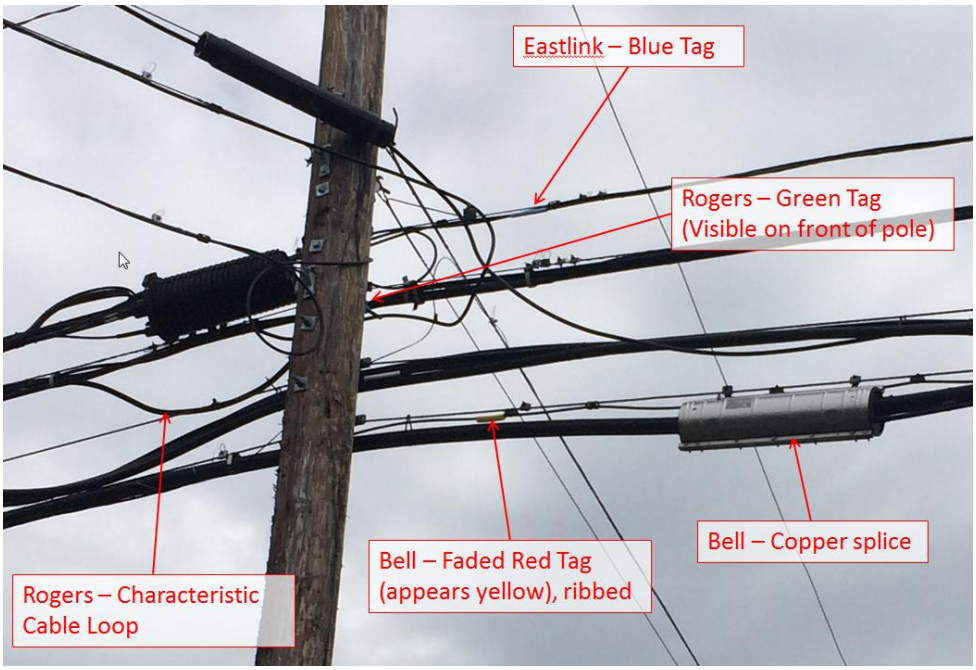
Identification of Bell Equipment

Equipment belonging to different communications companies can be identified by coloured tags present at pole attachments.

Bell – Red tags. These tags tend to fade to orange then yellow over time so care is required to not confuse with Eastlink's longer yellow tags. Bell equipment tags also have a 'ribbed' appearance similar to weeping tile.

Rogers – Green tags. Rogers also has a 'loop' at each pole attachment.

Eastlink – Yellow or blue tags. Eastlink's yellow tags can be distinguished from Bell's faded tags due to their longer length.



Messenger Strand

- Visually Inspect condition of strand for breakage, severe rust, frayed ends.
- Visually inspect for broken or loose lashing wire.
- Note locations for improperly sagged strand / cables requiring re-tensioning
- Note areas of inadequate clearance
- Note areas of inadequate separation from neutral / power space.
- High voltage ground missing / detached

General

- Visually check for issues with splice closures, strand attachments: improperly strapped, loosely hanging, covers open, etc.
- Vertical riser cables / conduit: visually check for improperly strapped, improper duct sealing; general damage
- Housekeeping: cleanup of utility related debris around pole
- Duplicate Poles / removal required
- Outstanding transfers

Additional Planning Details

When recording a deficiency, it is important to collect as much information as possible to assist in planning a repair.

Outage Requirements

- No Outage
- Single Transformer Outage
- Feeder Tap Outage
- Full Feeder Outage
- Multiple Feeder Outage
- Joint Use

Site Considerations

- Environmental
- Near School or Hospital
- High Traffic Area
- Within 15m of PPWSA
- Truck Accessible
- Number and Type of Customers Affected

On Site Repairs

All deficiencies shall be recorded in the Distribution Asset Management System with the exception of minor repairs that can be completed on site. These minor repairs may be completed by the inspector during a distribution line inspection, or by a line crew completing planned repairs.

The following repairs may be completed on site during a distribution line inspection. The inspector shall carry the required materials to complete the repair.

- Replace or reattach a missing guy guard.
- Tighten a loose pre-form connection.
- Replace or reattach a missing ground cover.
- Add staples to an unsecured ground wire or ground cover.
- Replace or reattach a sign or equipment label.

The following repairs may be completed on site during a padmount transformer inspection. The inspector shall carry the required materials to complete the repair.

- Replace missing or broken bolts and locks.
- Install or reset fault indicators as required.
- Install danger stickers.
- Install PCB label if PCB information is available but label is missing.

A line crew that identifies a deficiency while completing a separate job shall report the deficiency to their supervisor. This deficiency will be entered into the Distribution Asset Management System and planned repairs will be completed. However, it is acceptable that minor repairs be completed on site if they can be completed safely and in a short time. A rule of thumb to use is if the repair is simple and can be completed in less than 20-30 minutes, it shall be completed on site and not recorded as a deficiency.

Any on-site repairs completed on Bell equipment is to be noted for billing to Bell.

Maintenance Classifications

All defects identified through the inspection process are given one of the following classifications based on the nature of the abnormal condition. Unless otherwise stated or directed, the response times shall be as follows:

PRIORITY	RESPONSE TIME
Emergency	Immediate
TD1	1 Week
TD2	1 Month
TD4	Next Budget Cycle
TD5	Opportunity Work Only

The shared responsibility for scheduling maintenance rests with the Planner and Line Supervisor.

If the Planner notes a deficiency that is considered to be an Emergency, he shall immediately notify the area Manager.

If a deficiency is noted to be a TD1 or TD2 priority, they will not be included on monthly maintenance schedules. It is the Planner's responsibility to ensure the appropriate personnel, whether Line Supervisors for line work or Maintenance Supervisor for contract maintenance, is aware of the work and of the high priority nature of the work.

A TD1 priority will permit time for formulating a plan of action to correct the deficiency. Planning should begin immediately to ensure corrective action is taken as quickly as possible after the identification of the deficiency.

Regional Managers / Supervisors will ensure corrective maintenance work is completed, in the time frames outlined above, to prevent failure from occurring.

While it is not possible to cover all conditions that a Planner may encounter, the general guidelines found in Appendix A can be used to assist in the classification of defects. In practice, the Planner will assign priority based on his knowledge and experience.

Appendix A- Deficiency Reference Tables

Wood Poles

DEFICIENCY	EMERGENCY	TD1	TD2	TD4	TD5
Damaged	Broken	Serious Horizontal Cracks			
Pole Rot		Rotted to Imminent Failure		Rotted - Failed Core Test	
Woodpecker Holes				Severe Woodpecker Holes	
Unauthorized Attachments					Unauthorized Attachments
Off Vertical	Severe Lean - Failure Imminent			Lean >10°	
Pole Crib	Major Frame Damage - No Longer Supporting Pole			Frame Damaged - Rocks Becoming Loose	
Pole Ground	Grounds Cut or Broken Near Ground Level Repaired by Planner During Inspection			Grounds Cut or Broken Above Ground Level	Ground Cover Missing Staples Missing Ground Rod Exposed No Pole Ground Installed
Backfilling	Large Hole – Public Safety Hazard		Pole Not Supported		

Cross Arms and Braces

DEFICIENCY	EMERGENCY	TD1	TD2	TD4
Cross Arm Damaged	Broken - Floating Phase Severely Crooked - Failure Imminent	Broken		Severe Rot or Cracked
Brace Bent, Missing or Hanging			Missing or Hanging	

Platforms

DEFICIENCY	EMERGENCY	TD1	TD2	TD4
Brace Damaged			Brace Loose	Severely Bent
Deck Damaged	Imminent Failure		Broken Beam	Deck Sagging

Anchors and Guys

DEFICIENCY	EMERGENCY	TD1	TD2	TD4	TD5
Guard Missing	Replaced by Planner During Inspection				
Preform Rusting			C or E Structure	All Others	
Loose Guy				Loose Guy	
Preform Unravelling			C or E Structure	All Others	
Broken Guy	C or E Structure or Public Safety		All Others		
Broken Rod or Fitting	C or E Structure or Public Safety		All Others		
Backfilling	Large Hole – Public Safety Hazard		Pole Not Supported	Pole Support Uncompromised	
Anchor Buried				Rotting preform	Stable
Ungrounded / Uninsulated	Pole has damaged insulators or damaged porcelain cutout		Rock anchor, undamaged 2-piece or 8080 insulators or porcelain cutout	All other ungrounded or uninsulated guys	

Polymer Type Insulators

DEFICIENCY	EMERGENCY	TD1	TD2	TD4
Split/Broken	Broken	Polymer Split/Rod Exposed		Splits, Skirts Missing
Floating	Floating			
Stand-Off Bracket	Broken			

Porcelain Type Insulators

DEFICIENCY	EMERGENCY	TD1	TD2	TD4
Cracked/Broken	Broken	Insulator Severely Cracked		Chips or Cracks, Skirts Missing
Floating	Floating			
Stand-Off Bracket	Broken			
2 Piece / 8080 Insulators		Damaged		All Other Locations

Primary Conductor

DEFICIENCY	EMERGENCY	TD1	TD2	TD4
Sag	Public Safety Hazard			Could Cause Slapping
Clearances to Buildings/Signs	Exceeds CSA Standards			Above Dwelling Within CSA Standards
Broken Strands	>1/4 Strands Broken		<1/4 Strands Broken Pencilling	1 - 2 Strands Broken Temporary Repairs
Floating	Floating			
Tie Wires or Clamps	Broken			Loose or Unravelling
Missing Line Guards				On Aluminum or Stranded Copper
Warning Markers	Hanging			Becoming Loose or Missing
Quick Sleeves				All Locations

Neutral

DEFICIENCY	EMERGENCY	TD1	TD2	TD4
Sag	Public Safety Hazard		Could Cause Slapping	
Clearances to Buildings/Signs	Exceeds CSA Standards			Above Dwelling Within CSA Standards
Broken Strands	>1/4 Strands Broken		<1/4 Strands Broken Pencilling	1 - 2 Strands Broken Temporary Repairs
Floating	Floating			
Warning Markers	Hanging			Loose or Missing
Quick Sleeves				All Locations

Stirrups/Leads/Primary Connections

DEFICIENCY	EMERGENCY	TD1	TD2	TD4
Stirrups Missing				
Lead Length Excessive				Could Cause Slapping
Broken Strands		>1/4 Strands Broken on Main Trunk	<1/4 Strands Broken on Main Trunk	<1/4 Strands Broken – Not Main Trunk Temporary Repairs
Pencilling on Solid Leads		Pencilling		

Underground Cables/Conduit/Guards

DEFICIENCY	EMERGENCY	TD1	TD2	TD4	TD5
Guard Loose			Guard Hanging Off		Guard Loose
Guard Missing		High Traffic Pedestrian Area		Low Traffic Area	
Cable Damaged	Cable Severely Damaged/Broken		Jacket Damaged		
Pothead Damaged			Excessive Pitch Leaking		Minor Pitch Leaking
Cracked/Broken Bushing	Broken	Insulator Severely Cracked			Minor or Moderate Chips or Cracks, Skirts Missing

Pole Mounted Transformers

DEFICIENCY	EMERGENCY	TD1	TD2	TD4
Tank Ground	Ungrounded	Only 1 Ground		
PCB Label				Missing
Cracked/Broken Bushing		Bushing Completely Broken		Chips or Cracks, Skirts Missing
Leaking/Weeping	Leaking or Weeping			
Rusting	Rust Causing Leaking or Weeping			Severe Rust
Blown Fuse	Blown Fuse			
Mounting Bracket	Bracket split/ Showing signs of failure		Sensitive locations	Design flaw identified but not showing signs of failure

Metering Tanks

DEFICIENCY	EMERGENCY	TD1	TD2	TD4
Tank Ground	Ungrounded			
PCB Label Applied				Missing
Cracked/Broken Bushing		Bushing Completely Broken		Chips or Cracks, Skirts Missing
Leaking/Weeping	Leaking or Weeping			
Rusting	Rust Causing Leaking or Weeping			Severe Rust

Lightning Arrestors

DEFICIENCY	EMERGENCY	TD1	TD2	TD4
Floating	Floating			
Grounded Incorrectly/Ungrounded				Grounded Incorrectly/Ungrounded
Insulator Damage	Broken	Severe Splits or Cracks		Splits or Cracks, Skirts Missing
Failed	Failed. No Power to Customer			Failed. Power Still On.
Missing				Area prone to lightning strikes

Capacitor Banks

DEFICIENCY	EMERGENCY	TD1	TD2	TD4
Tank Ground	Ungrounded			
Leaking/Weeping	Leaking or Weeping			
Blown Fuse	Blown Fuse			
Insulator Damage	Broken	Severe Splits or Cracks		Splits or Cracks, Skirts Missing
Rusting	Rust Causing Leaking or Weeping			Severe Rust

Padmount Transformers

DEFICIENCY	EMERGENCY	TD1	TD2	TD4
Snow Marker			Missing	
Rusting	Rust causing leaking or weeping		Severe rust; leak imminent in less than 1 year – replacement required	Surface rust – painting required
PCB Label				Missing
Defective door	Broken off unit		Broken hinge	
Defective lock/missing bolts	Replace on site			
Xfmr moved off pad			Moved	
Incorrect Co. Number			Missing/Incorrect Co. Number	
Vegetation				Vegetation management required
Primary/Secondary bushings		Broken		
Test cap on load break elbows			Missing	
Ground Strap				Broken/Missing
Connections/Terminations	Completely broken		Damaged	

Cutouts

DEFICIENCY	EMERGENCY	TD1	TD2	TD4
Switch Damaged	Switch Damaged			
Insulator Damage	Broken	Severe Splits or Cracks		Splits or Cracks, Skirts Missing
Porcelain				At Tie Points, Main Trunk, Large Taps, Major Customers
Label Missing			Label Missing	
Current Limiting Fuse Required				CLF Required

In-Line Switches

DEFICIENCY	EMERGENCY	TD1	TD2	TD4
Insulator Damage	Broken	Severe Splits or Cracks		Splits or Cracks, Skirts Missing
Label Missing			Label Missing	

Gang Operated Switches

DEFICIENCY	EMERGENCY	TD1	TD2	TD4
Grounding	Switch Ungrounded No Ground Mat			
Insulator Damage	Broken	Severe Splits or Cracks		Splits or Cracks, Skirts Missing
Label Missing			Label Missing	

Vegetation and Right-of-Way

DEFICIENCY	EMERGENCY	TD1	TD2	TD4	TD5
Tree Trimming	Touching Conductor or Showing Signs of Burning		Within 2ft of Primary Conductor		
Brush Clearing	Touching Conductor or Showing Signs of Burning		Within 2ft of Primary Conductor	Above Neutral but Greater than 2ft from Primary Conductor	
Encroachments					Encroachments