Q. "2026 Capital Budget Application," Newfoundland Power Inc., June 27, 2025, Supporting Materials, Substations: 2.1, p. 5.

> **Additionally, power transformers are scheduled for a major overhaul every 12 years.**

How did Newfoundland Power determine the frequency of 12 years for major overhaul of power transformers?

A. Newfoundland Power based the 12-year interval for major transformer overhauls on the Company's operating experience with its transformer fleet. The overall maintenance of a power transformer is an important factor in determining the 12-year full maintenance interval.

The frequency of power transformer maintenance activities are as follows:

(i) Full transformer maintenance is scheduled every 12 years.[1] This frequency is subject to change depending on transformer oil analysis, physical condition and coordination with other ongoing projects.[2]
(ii) Transformer protection checks are completed every six years (if applicable).[3]
(iii) Transformer main tank and tap changer oil is tested annually. This includes dissolved gas analysis and furan analysis. For units above 50 years of age, transformer main tank oil is tested twice per year.[4]
(iv) Infrared scans are completed annually.[5]
(v) Visual inspections are completed approximately every six weeks during routine substation inspections.[6]

1 Full transformer maintenance includes megger testing, power factor testing, capacitance testing, winding resistance testing, and transformer turns ratio testing. Transformer deficiencies are corrected during the maintenance.
2 The 12-year full transformer maintenance cycle could be lower or higher. The cycle depends on the condition reflected in the latest oil samples and other factors, such as whether there is an opportunity to coordinate with the deployment of a portable substation for capital work.
3 Transformer protection checks are completed on gas detector relays and temperature gauges. Checks include a visual inspection of protection equipment, megger testing, voltage tests, alarm checking, cooling checks, and moisture prevention.
4 Oil tests include standard oil tests and dissolved gas in oil analysis. Standard oil tests check for contaminants and moisture, which at unacceptable levels can lower the dielectric strength of oil and cause a fault. Dissolved gas analysis is used to monitor and diagnose internal transformer electrical problems, such as the presence of arcing or poor electrical connections.
5 Infrared scans use a thermal imaging camera to check the temperature of equipment and its connections. If a problem is detected, corrective work will be completed, such as replacement of a terminal connection.
6 Visual inspections on power transformers include checks for tank and cooler leaks, cooling fan and pump operation, operation of liquid and winding temperature equipment, oil level, tank pressure, breather operation and controls operation.

The recommended time-based inspection interval for power transformers is 10 years.[7] Newfoundland Power's condition-based monitoring supports extending the interval to 12 years, while enabling the Company to make informed decisions to expedite overhauls, as necessary.

A 12-year cycle enables Newfoundland Power to plan and complete overhauls efficiently, without creating operational pressure on the system or critical assets, such as portable substations required for transformer offloading. Based on Newfoundland Power's operating experience, a 12-year overhaul interval has proven to be appropriate and effective.

[7] *CSA C22.3 No. 11:22 Maintenance of Electric and Communication Utility Equipment and* Systems indicates that the minimum time-based approach for detailed inspections of station transformers is 10 years.