B. Inspection and Maintenance of Distribution Substations

Mass. Electric maintains distribution substation apparatus in accordance with the Company's Electrical Maintenance Standards (EMS), which set forth in detail for each type of apparatus what should be checked and the tests to perform for the check. The EMS are attached as Book 7. There are many types of inspections: visual, operational, diagnostic, internal, and acceptance. See Book 7, pp. 31-33 for a description of these inspections. The Company performs a visual and operational inspection of every substation at least every two months, and performs these inspections on certain critical facilities more often. The employees who perform the inspections make the repairs that they are capable of making at the time of inspection. The EMS also provides detailed information on how to perform the inspections and tests. This approach provides uniform and measurable standards for inspection and maintenance of substation apparatus.

The Company has developed a Maintenance Priority System (MPS) in order to prioritize over 9,000 pieces of equipment for inspection and maintenance based on a variety of factors, including the interval since the last diagnostic and internal inspection, the number of operations since the last inspection, the number of fault operations, and other items. See Book 7, pp. 19-20. Some inspections occur on a periodic basis, such as annual infrared inspections of critical substations, in which the Company identifies temperature anomalies that could indicate or lead to equipment failures. See Book 3, Attachment 3 for a sample report. The Company then takes follow-up measures to avert future problems. The Company performs other inspections when a combination of factors, such as

time, operations, and fault operations, together indicate that an inspection is warranted.

C. Inspection and Maintenance of Overhead Plant

The overhead distribution system is extensive and requires a significant and focused maintenance effort. There are several different programs in place.

The Company uses the Maintenance Priority System for certain electrical apparatus, including line reclosers and line voltage regulators. The Company has a separate program for line capacitor banks, which are inspected twice annually in advance of the summer and winter peak loading seasons.

A major component of maintenance of the overhead distribution system, and one that has a direct impact on reliability, is the Company's vegetation management program. This program is a feeder based program, with an $8.5 million budget in fiscal year 2001.

In addition, the Company visually inspects the mainline of feeders annually, which enables the Company to monitor the effects of the everyday occurrence of mechanical and electrical stresses from factors such as weather, animals, vegetation growth, and age. Because the Company can detect the vast majority of potential problems visually, before an interruption results, the Company has not needed to perform diagnostic testing.

Personnel well versed in distribution construction practices conduct these inspections, or "feeder patrols." They use standardized forms, designed to enable efficient and accurate data entry, and cover issues such as tree trimming needs, blown lightning arresters, transformers and side-taps without fuses, deficient

poles and crossarms, conductor and insulator problems, and other potential construction deficiencies. Depending on the nature of noted concerns, follow-up is directed to appropriate personnel to resolve. Book 8 provides feeder patrol sheets for the last twelve months. As these sheets indicate, the feeder patrols result in finding and repairing many items. Over 100 employees participate in these patrols.

The Company often performs additional inspections on the overhead distribution system to address particular issues. For example, the Company may perform an infrared inspection of feeders when they exhibit certain performance characteristics and visual inspections do not reveal problems. Infrared inspections typically identify overheating conditions that if left unattended could result in failed equipment and a subsequent interruption. In addition, the Company often performs inspections on step-down transformers to verify that the transformers are not approaching an overloaded condition. The Company inspects all subtransmission poles, which are typically in rights-of-way, on a ten year cycle, and replaces or reinforces them as necessary. These poles are critical in that they supply substations that in turn supply many customers. Finally, for the past few years, the Company has performed construction audits to ensure that new construction is performed in accordance with the Company's Distribution Construction Standards.

The Company intends to implement a targeted pole replacement program for distribution poles. (The Company co-owns most of its poles with Verizon.) Because wood pole failure due to deterioration accounts for a very small number

of interruptions, as shown in Book 3, Attachment 4, this program will review specific factors effecting operating life, such as pole age, geographic location, pole loading, reliability impact, replacement cost and wood condition. The ability to capture pole data easily and efficiently is required to implement this program. The Company is currently putting into place a geographic information system (NEEGIS) that will provide the capability to implement a targeted pole replacement program. Mass. Electric is initiating this system one district at a time, with the first district scheduled for implementation in the beginning of 2002.

D. Inspection and Maintenance of Underground Plant

The underground system is far more difficult to inspect than the overhead system. Access is limited due to the underground location, required safety measures (including atmospheric testing, manhole rescue precautions, traffic control, pumping), and lack of effective diagnostic procedures that will not either cause customer interruptions or equipment stress. In addition, the same attributes that make underground equipment for the most part impervious to the environment in which they operate often render non-invasive inspection techniques ineffective. For example, underground cables are designed to be sealed against moisture and water intrusion using combinations of polyethylene jackets, lead sheaths (on older cables), and intricate splicing techniques. Other equipment, such as submersible transformers, oil fuse cutouts, and vacuum switches are mechanically sealed. In order to perform electrical tests on this equipment, the protective and insulating systems would need to be breached and

stressed, potentially weakening their integrity. Therefore, other methods and approaches to underground inspections are warranted.

Some of the inspections currently performed on underground plant include:

1. Underground vaults are inspected.

2. Manholes are inspected/documented prior to entry and work being performed

3. Oil fuse cutouts (4kV submersible disconnect switches) are visually inspected whenever manhole entry is made. Replacement decisions can sometimes be made based on appearance (deterioration, rust).

4. Network protectors, network transformers, and padmounted switchgear are inspected based on the MPS Critical Number.

5. Cathodic protection (corrosion prevention) systems are inspected periodically.

6. Infrared inspections of select underground circuit components, such as elbows, separable connectors, pre-molded splices, when appropriate, or when looking for common failure modes.

The Company intends to begin an underground improvement initiative. This initiative will target areas that exhibit repeat failures and high operating costs and will focus on equipment such as oil fuse cutouts, cathodic protection,

grounding, and and a life extension process for underground cross-linked polyethelyne cable. In addition, it will review practices across the Company's districts to determine if any additional opportunities exist to improve or strengthen maintenance practices.