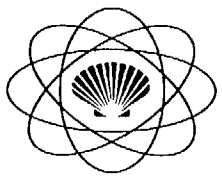
Calvert Cliffs
Containment Tendon Project

Presentation to the Nuclear Regulatory Commission
Containment Tendon Project
November 16, 2000



Calvert Cliffs Nuclear Power Plant, Inc.

Enclosure 2

Project Members

Mike Navin -Superintendent of Tech. Support Master Section

Joe Jaeger - System Manager

Donna Moeller - Senior Engineer - Nuclear Regulatory Matters

Jeff Poehler - Materials Engineer

Jon Woodfield - Civil Design Engineer

Presentation Outline

Purpose

- To discuss the corrective action plan

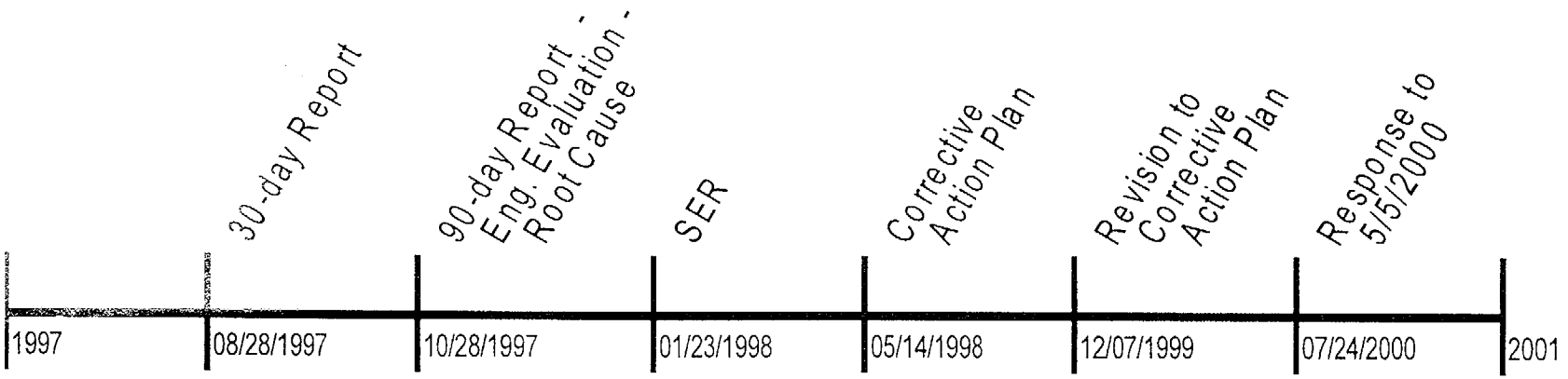
Overview of Information

Current Condition of Containment

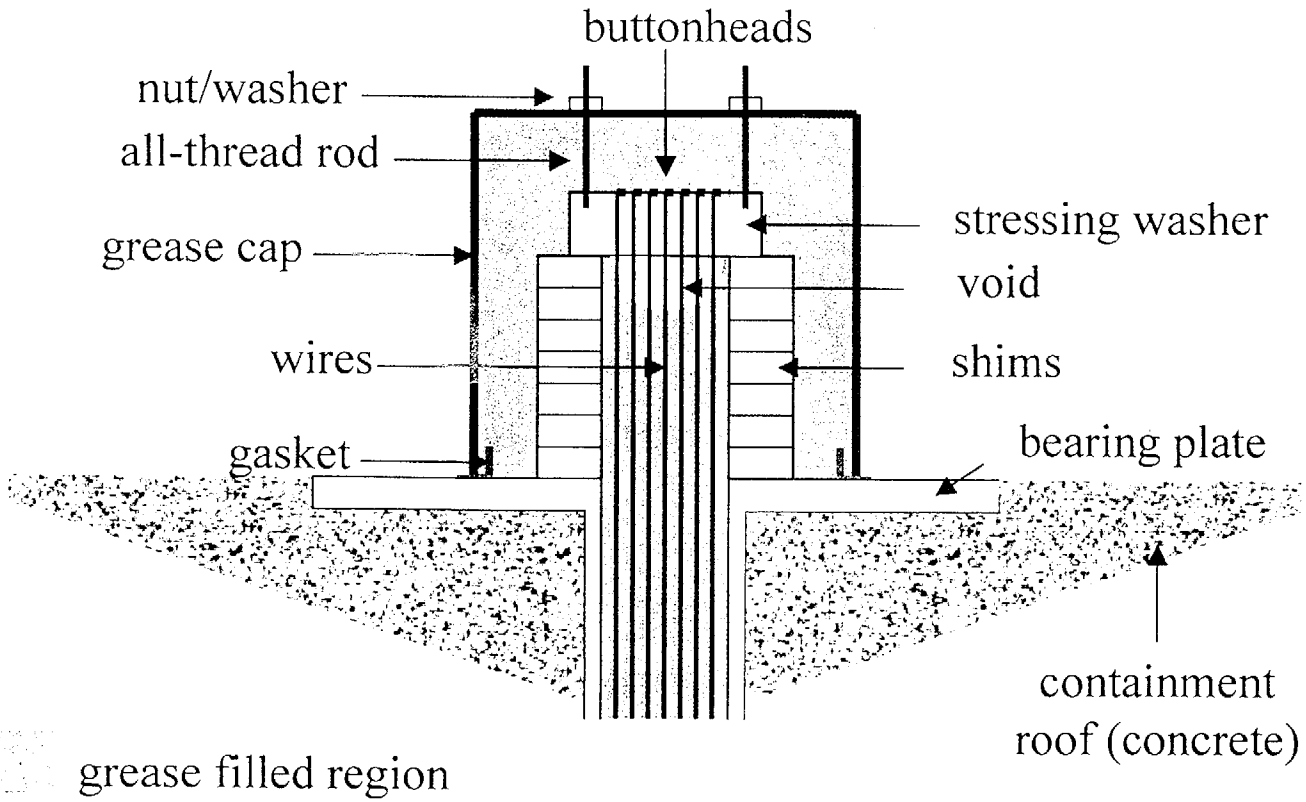
Corrective Actions

- Repair and Replacement
- Inspection Program

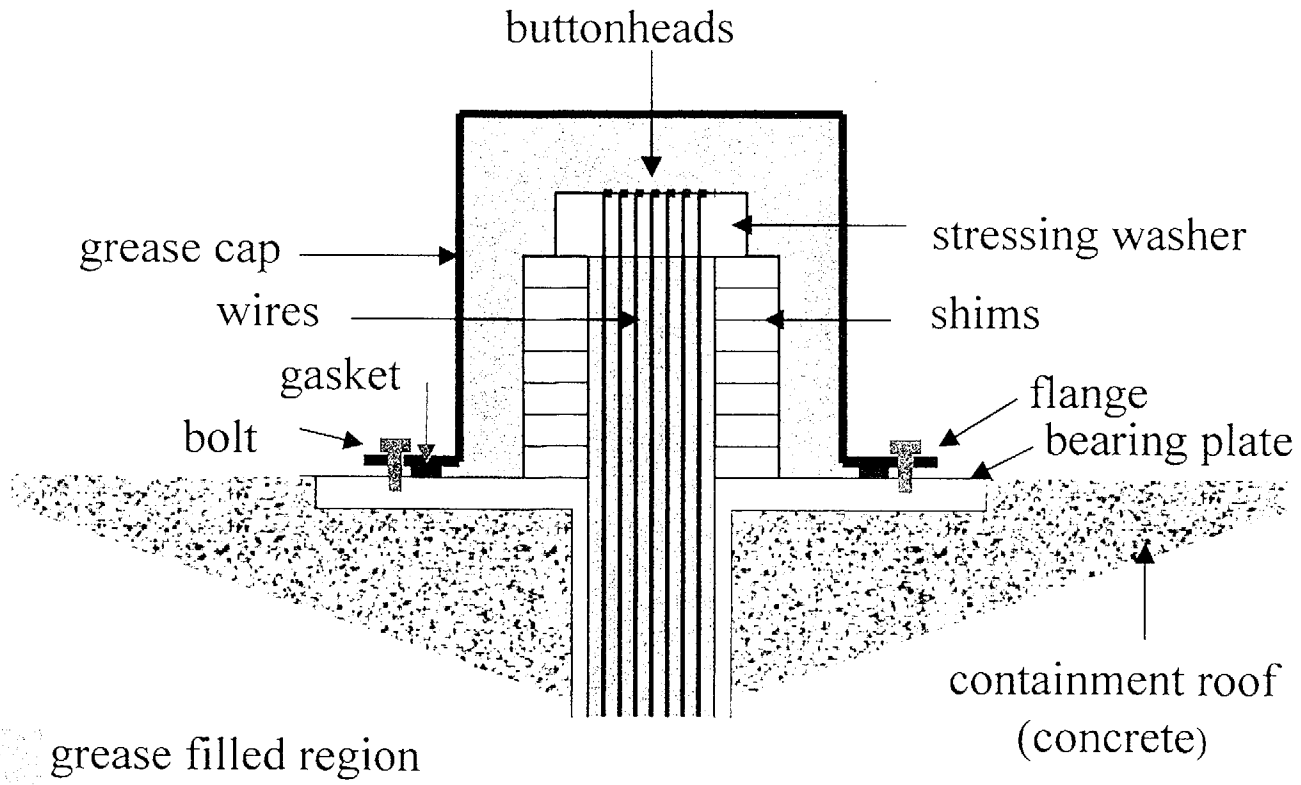
Overview


30-day Report
90-day Report - Eng. Evaluation - Root Cause
SER
Corrective Action Plan
Revision to Corrective Action Plan
Response to 5/5/2000
1997
08/28/1997
10/28/1997
01/23/1998
05/14/1998
12/07/1999
07/24/2000
2001

Original Design Grease Cap



New Design Grease Cap



Overview

Future

December Submittal Will Include:

- Response to questions received on 9/20/2000
- Number of tendons that will be replaced by end of 2002
- Actions to be taken on remaining tendon population
- Inspection Program

Containment Tendon Project Goal

Ensure Containments Meet Design Requirements Until End of Life 2034 and 2036

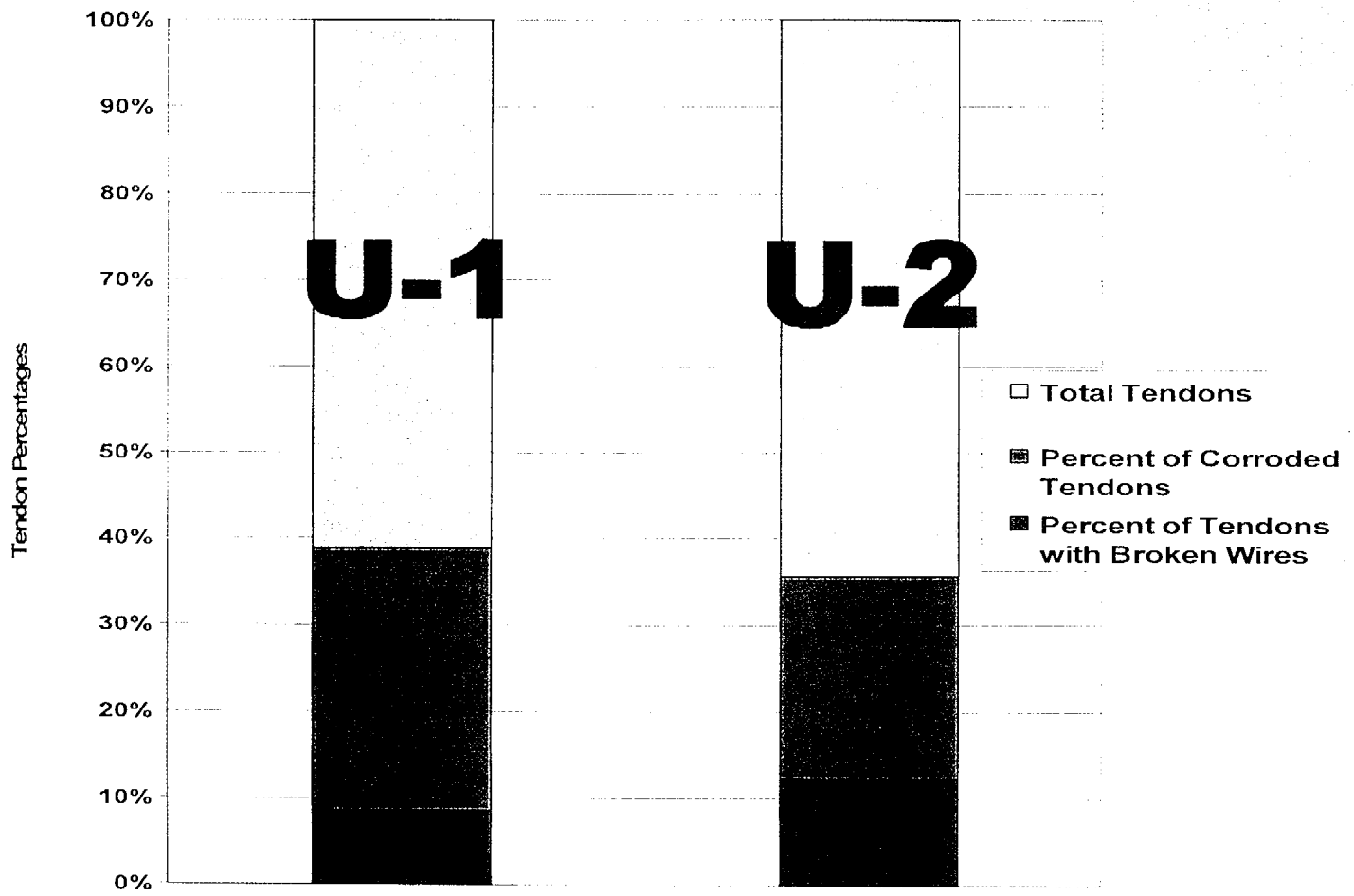
Overview

2000 Activities

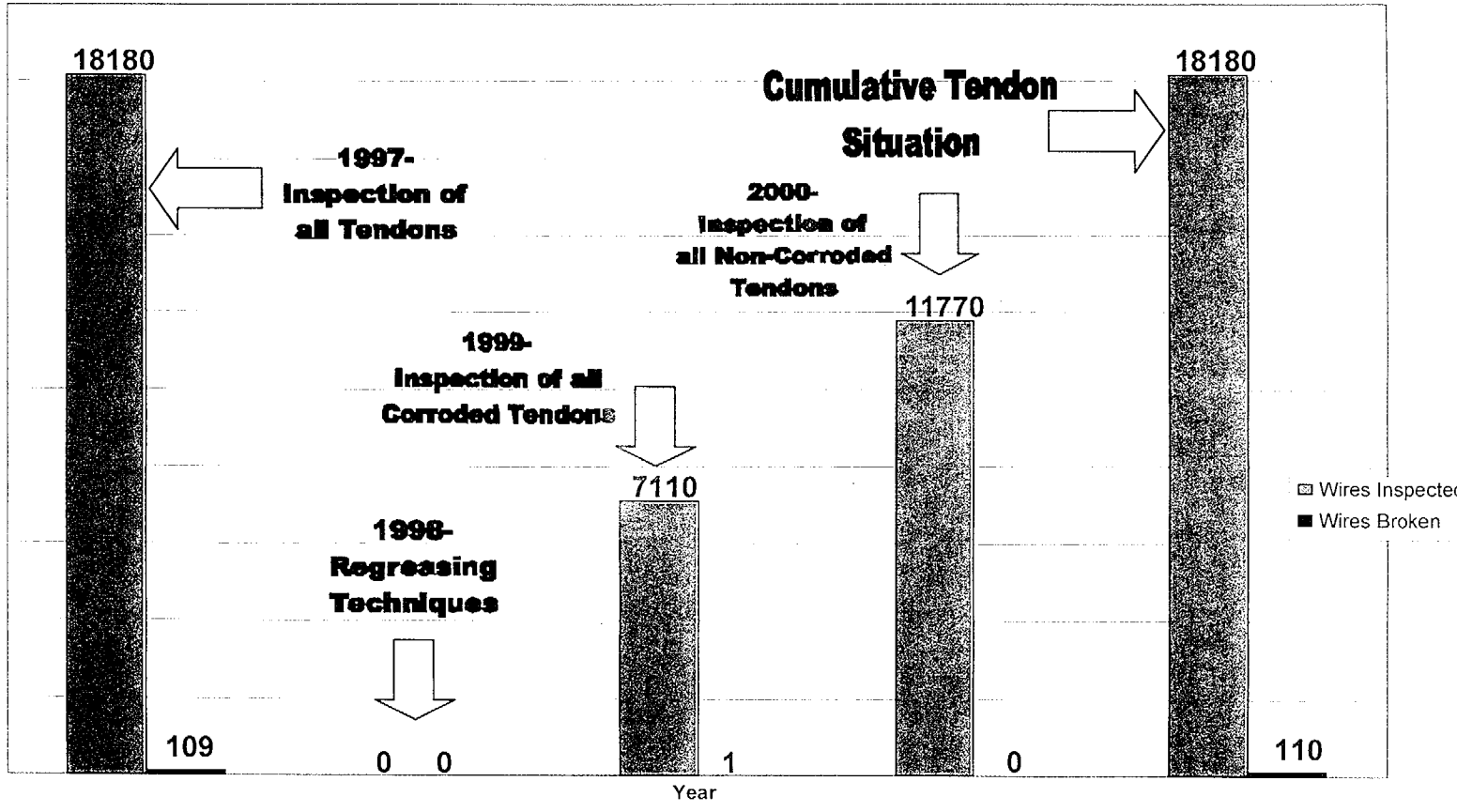
Inspected Non-Corroded Tendons

- New Grease
- New End Caps
- No Additional Broken Wires

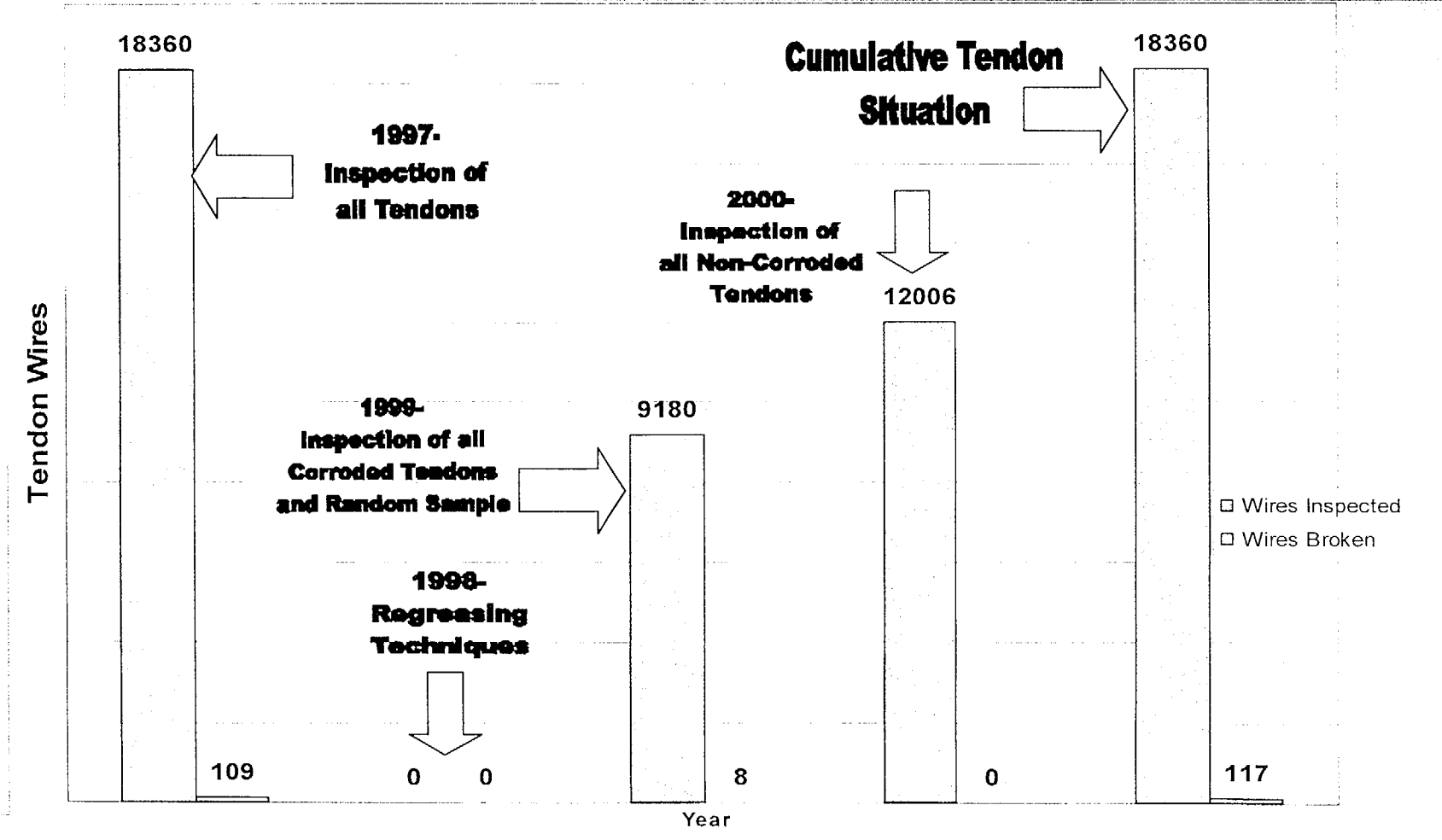
Tendon Summary



U-1 Tendon Wire Summary



U-2 Tendon Wire Summary



Planned Corrective Actions

Regrease Non-Corroded Vertical Tendons

Replace Vertical Tendon Caps and Gaskets

Replace Selected Vertical Tendons

Restress Vertical Tendons with Low Lift-Off

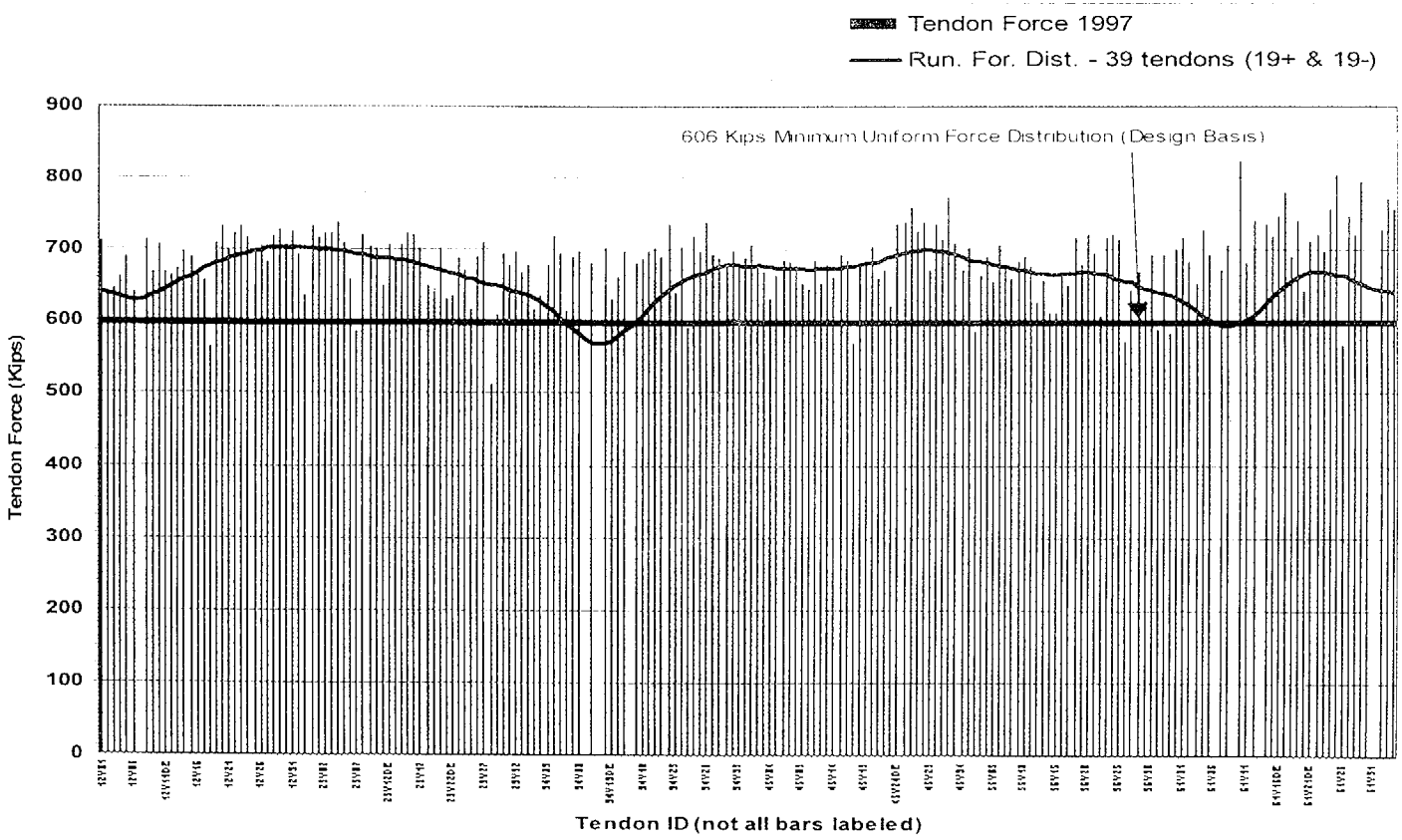
Enhance Inspection Plan

Planned Corrective Action

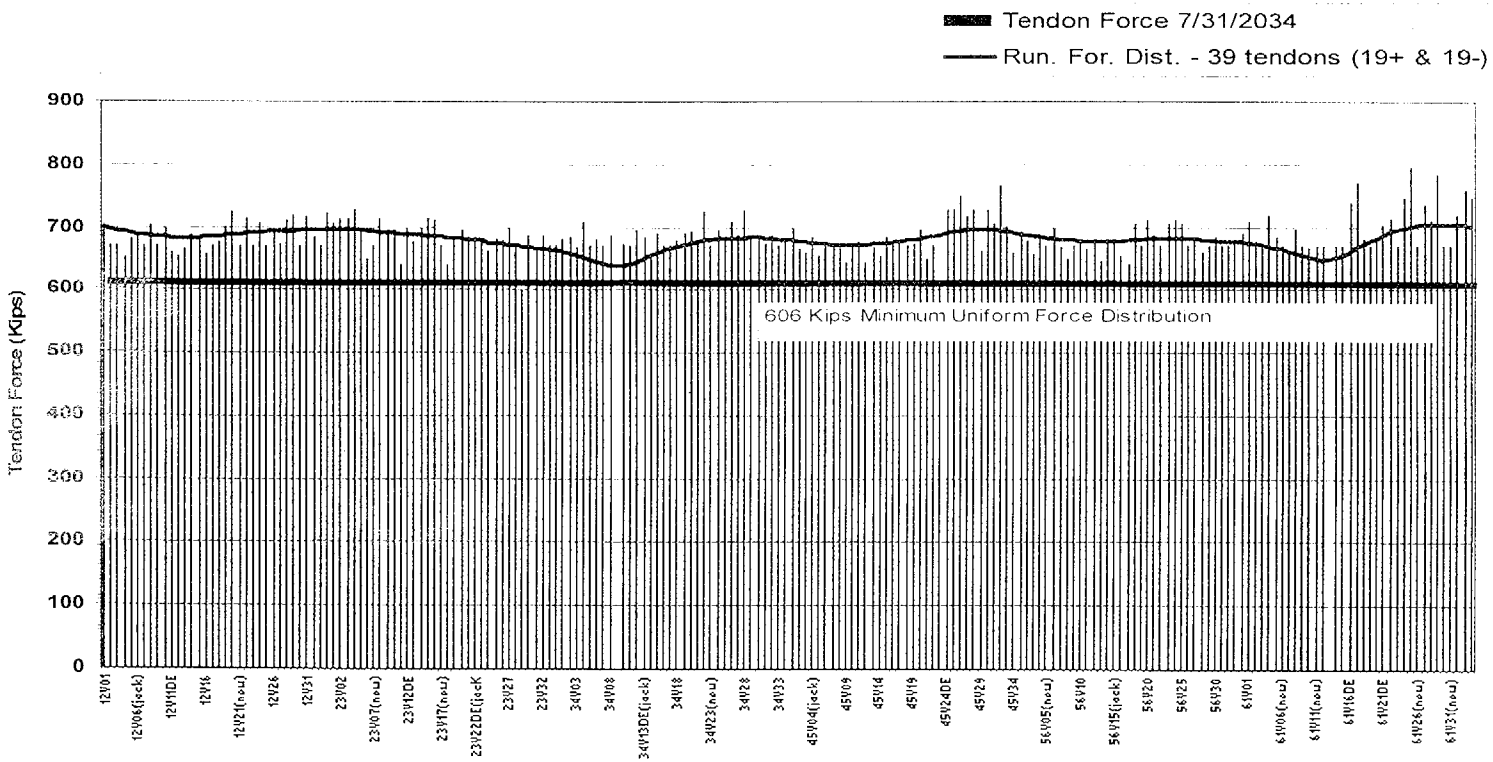
Selection Process for Vertical Tendon Replacement in 2002

- Replace corroded tendons with at least 2 broken wires
- Replace corroded tendons demonstrating lower liftoff forces
- Replace corroded tendons to ensure uniform distribution of prestress
- Replace corroded tendons to ensure uniform distribution after accounting for prestress loss of statistical model.

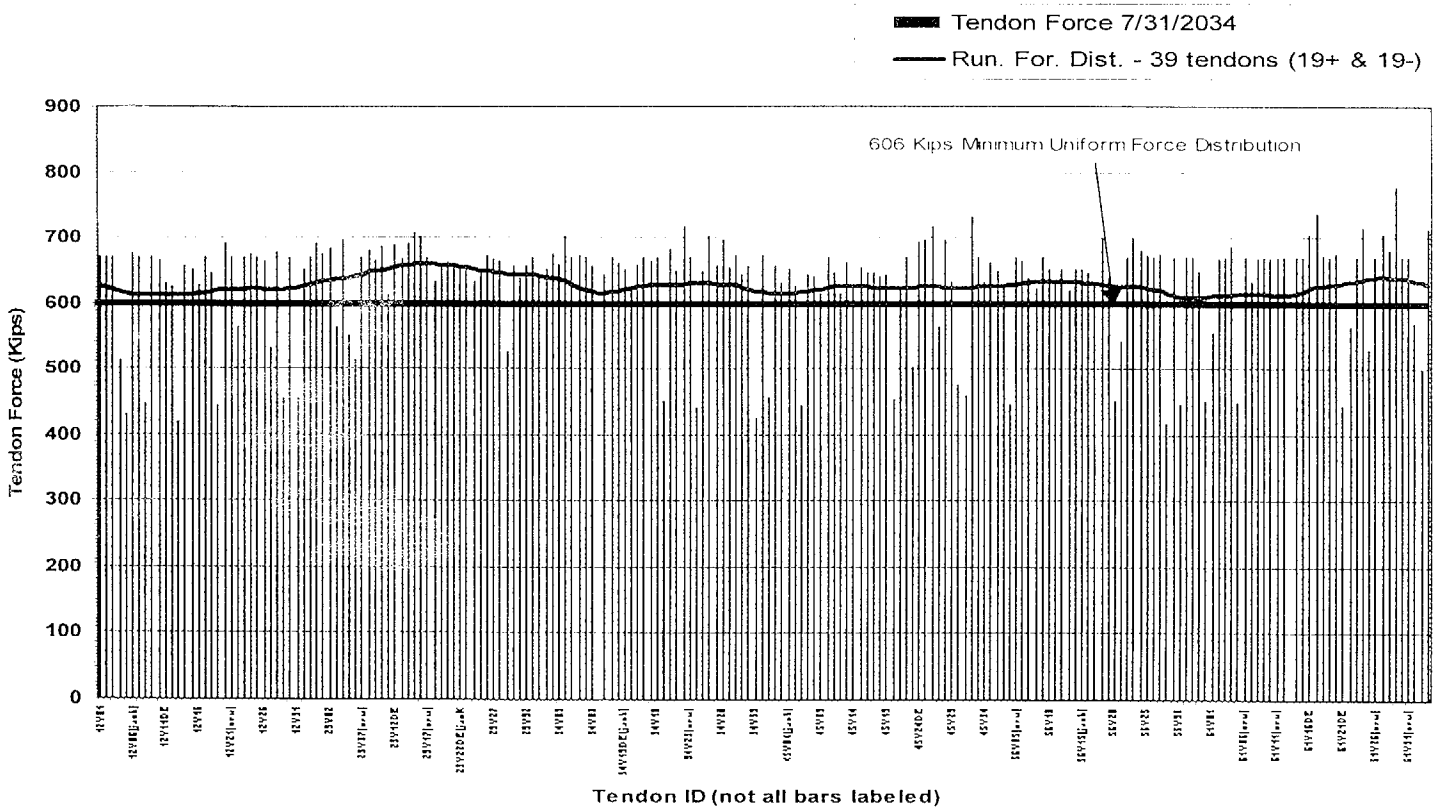
Unit 1 1997 Running Force Distribution



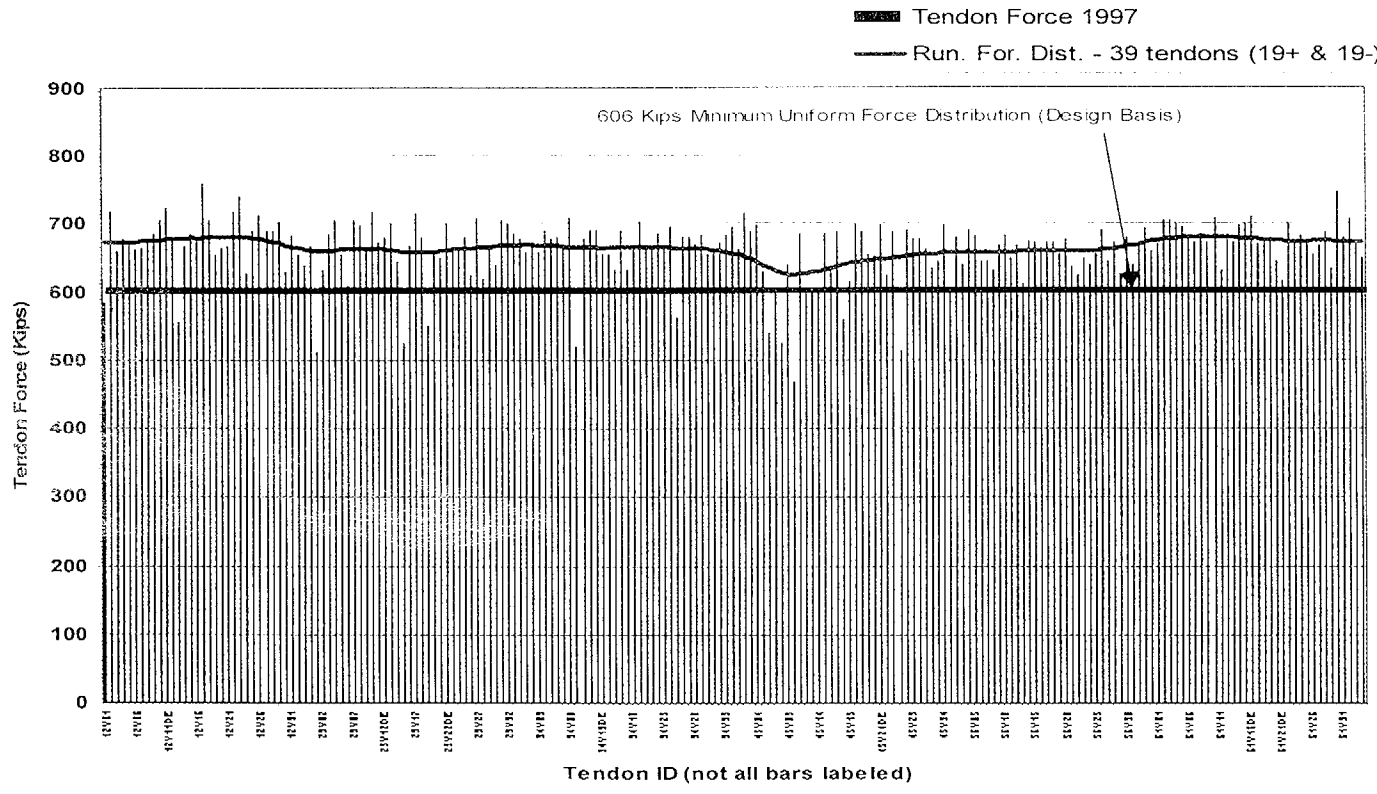
Unit 1 2034 Running Force Distribution w/ Tendon Replacement/Restressing and No Wire Breaks Considered



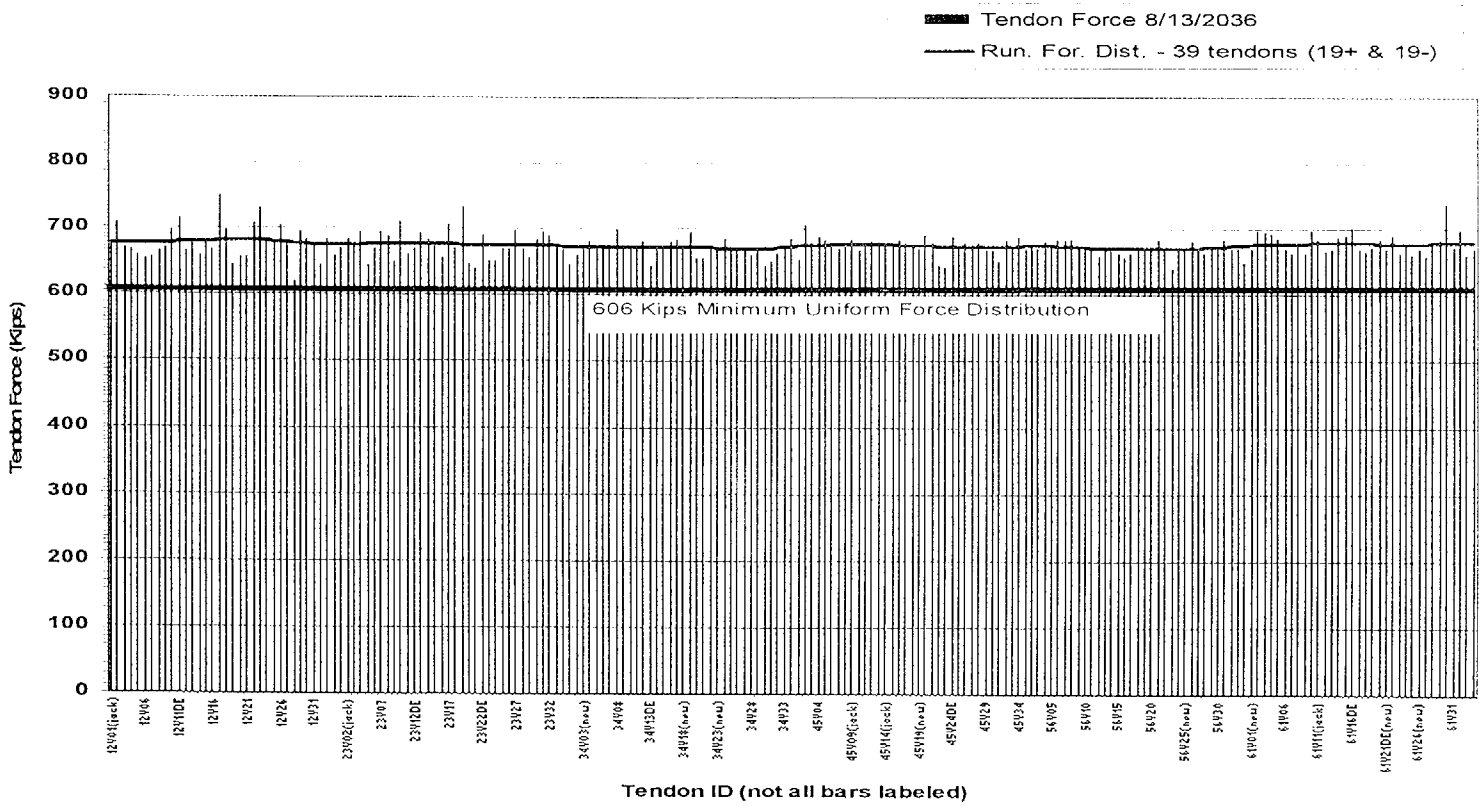
Unit 1 2034 Running Force Distribution w/ Tendon Replacement/Restressing and Wire Breaks



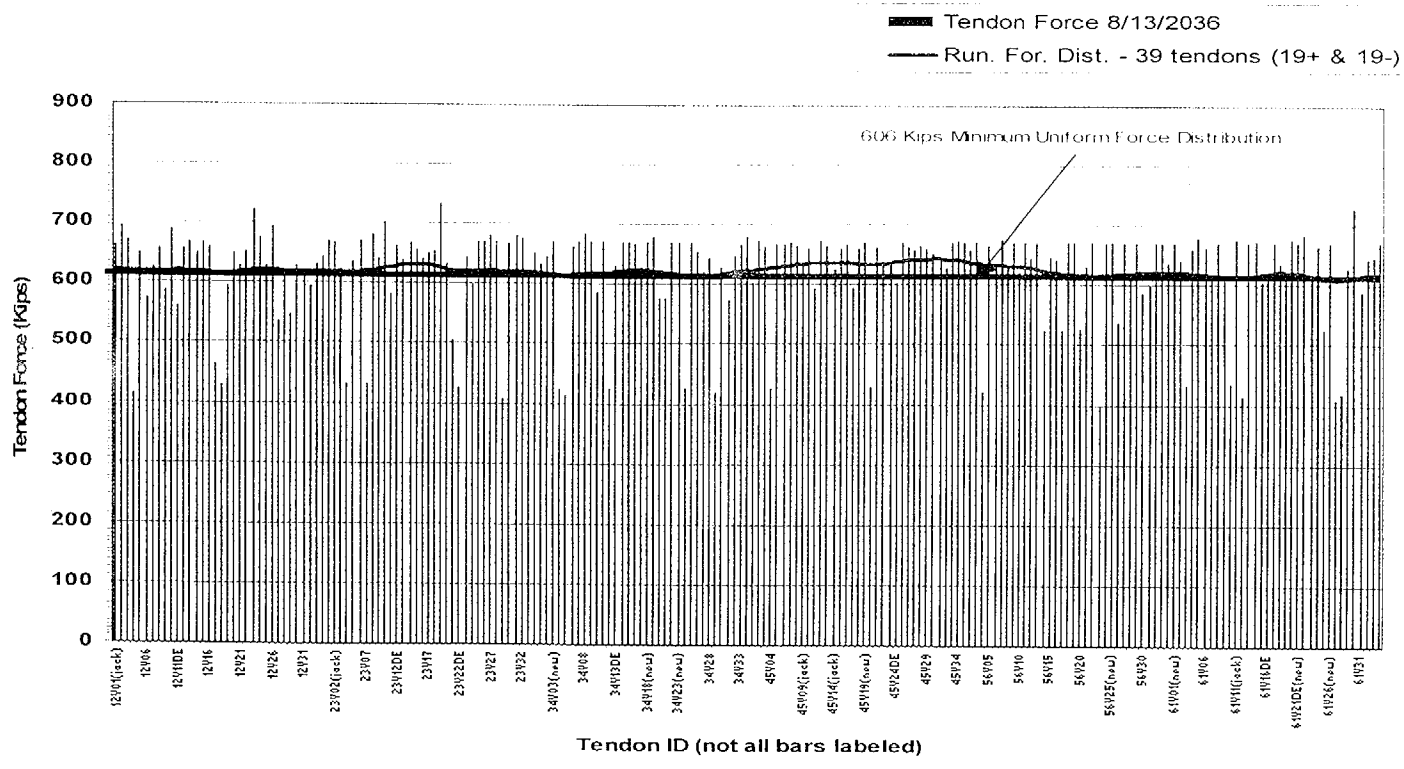
Unit 2 1997 Running Force Distribution



Unit 2 2036 Running Force Distribution w/ Tendon Replacement/Restressing and No Wire Breaks Considered



Unit 2 2036 Running Force Distribution w/Tendon Replacement/Restressing and Wire Breaks



Planned Corrective Action

Corroded Tendons

Number of Tendons Planned for Replacement

- Unit - 1 ~ 40
- Unit - 2 ~ 40

Inspection Plan

Code Required Inspections

- Lift-Offs
- Wire Examination and Testing
- Grease Composition Analysis
- Visual Inspections

Enhanced Inspection

- Visual Inspections

By End of 2001

Project Work

- Regreasing Tendons
- Replacing End Caps
- Procuring Tendons
- Planning and Scheduling

By End of 2002

Code Inspection

- Complete Five-Year Tendon Surveillance
  - — Increase sample size due to corrosion
  - — Lift-offs on U-2 and visuals for U-1

Enhanced Inspection

- Reinspect All Corroded Tendons For Broken Wires

By End of 2005

Enhanced Inspection

- Random sample of tendons visually inspected to verify that predictions of model are still bounding
- Correct statistical estimates for broken wires utilizing field results

By End of 2007

Code Inspection

- Complete Five-Year Tendon Surveillance
  - Increase sample size due to corrosion
  - Lift-offs on U-1 and visuals for U-2

Enhanced Inspection

- Validate Statistical Model
  - Random sample of tendons visually inspected to verify that predictions of model are still bounding
  - Correct statistical estimates for broken wires utilizing field results

At 5 Year Surveillance Intervals

Code Inspection

- Complete Five-Year Tendon Surveillance
  - — Increase sample size due to corrosion
  - — Lift-offs and visuals inspections alternating between Units every Surveillance.

Enhanced Inspection

- Validate Statistical Model
  - — Random sample of tendons visually inspected to verify that predictions of model are still bounding
  - — Correct statistical estimates for broken wires utilizing field results

Conclusions

Combination of restressing and replacing containment tendons will ensure containment meets design requirements through 2034 (U-1) and 2036 (U-2)

Inspection program will ensure effectiveness of our corrective actions

DRAFT

ADDITIONAL INFORMATION REQUEST
PERTAINING TO THE MECHANICAL & CIVIL ENGINEERING BRANCH
STAFF REVIEW OF THE "RESPONSE TO REQUEST FOR ADDITIONAL INFORMATION
CONCERNING THE CONTAINMENT TENDON LONG-TERM CORRECTIVE ACTION PLAN"
SUBMITTED BY CALVERT CLIFFS NUCLEAR POWER PLANT, INC. DATED JULY 24, 2000
(DOCKET NOS. 50-317 & 50-318)

References:

1. Calvert Cliffs Nuclear Power Plant, Inc. Letter to US NRC Titled, "Calvert Cliffs Nuclear Power Plant Unit Nos. 1 & 2; Docket Nos. 50-317 & 50-318, Response to Request for Additional Information Concerning the Containment Tendon Long-Term Corrective Action Plan (TAC Nos. MA7782 and MA7783), Dated July 24, 2000

2. BGE Letter to US NRC Titled, "Calvert Cliffs Nuclear Power Plant Unit Nos. 1 & 2; Docket Nos. 50-317 & 50-318, Revision to the Containment Tendon Long-Term Corrective Action Plan," dated December 7, 1999.

EMEB staff has completed its review of Calvert Cliffs Nuclear Power Plant, Inc.'s submittal dated July 24, 2000 (Ref. 1) and determined that additional information is needed in order to complete the review. The requested additional information is described in the following staff RAI:

1. Since the extended model for containment building vertical tendon degradation for Calvert Cliffs Units 1 and 2 discussed in attachment 1 to reference 1 is based on minimal data (i.e., limited data from 1997 and 1999 inspections) and several unverified assumptions, staff considers it is neither appropriate nor acceptable to rely solely upon the results of the model prediction in defining Calvert Cliffs' containment tendon long-term corrective action plan. The staff believes that it is essential for Calvert Cliffs Plant, Inc. to implement periodic future inspections of reasonable scope and frequency to verify that the model consistently predicts an upper bound to actual Calvert Cliffs' tendon degradation experience. Therefore, the licensee is requested to provide a periodic future inspection program with discussion of basis for the program contents which will amply fulfill the above noted need for verification.

   As part of this information request, please indicate the completion status of your planned summer 2000 inspection which you expected to complete your evaluation by October 2000. As appropriate, discuss how did the latest inspection data verify the expected upper-bound characteristics of the model.

2. With respect to third paragraph, page 3 of reference 2, Calvert Cliffs Plant Inc. stated that, "...Depending on the results of the engineering analysis, replacement may be any number between 0 and 100 % of the 153 vertical tendons identified during the 1997 inspection to be severely corroded." Please discuss specific criteria to be used in deciding the final percentage of tendons to be replaced and the basis thereof. Also confirmed that the corrective action schedules described in the fourth paragraph of the same page will be maintained by Calvert Cliffs Plant, Inc.