NRC Management Presentation

Detroit Edison

A DTE Energy Company

Agenda

- Current Plant Status
- Performance Concerns
  - Emergency AC Power Sources
    - CTG Availability
    - EDG Availability
      - Mixed Oil Status
      - EDG-14 Bearing Failure
    - EDG Reliability Improvement Effort
- Other Issues/Actions
  - Engineering Excellence Plan
  - Standby Feedwater Pump
  - Other Actions

Current Plant Status

- Plant Performance Overview
- Focus Areas
  - Work Management
  - Engineering
  - Partnership
  - Safety/Human Performance
  - Training of New Employees
  - Equipment Reliability

CTG Availability

- Current Performance against established criteria
  - MR Performance Criteria/Current Performance at the end of July 2001
    - Conditional Probability >= 90%/ **Actual = 93.16%**
    - < 3 Failures in Last 20 Demands/**Actual = 1 Failure**
    - < 5 Failures in Last 50 Demands /**Actual = 4 Failures**
    - < 8 Failures in Last 100 Demands /**Actual = 6 Failures**
    - <= 3 MPFF/2 cycles /**Actual = 0 Failures**
    - Total out of service hours for past year = **290 hours**

CTG Availability (cont.)

- History of Performance Issues and Corrective Actions
  - Feb. 96' - CTG 11-1 declared a(1) under Mrule
    - "full refurbishment" of the peaker completed
    - over 31 corrective actions completed, including component replacements and modifications
    - reliability demonstration performed in Nov 97' (50 consecutive start and load tests with no failures)
    - 1 yr monitoring period with no Mrule functional failures
    - returned to a(2) Oct. 99'

CTG Availability (cont.)

- History of Performance Issues and Corrective Actions (cont.)
  - Jan, 01' - CTG 11-1 declared a(1) under Mrule
    - Jan, 2000 - Alarm and control problems with Mark V Control System. Replaced circuit cards and applied antifretting grease to cable connections.
    - June, 2000 - Failed to start due to shorted diode across starting relay for starting diesel engine. Diode was replaced.
    - Dec 6, 2000 - Trip on high exhaust temp during startup due to failed splice in power cable to atomizing air booster pump motor. Cable splice was replaced.

CTG Availability (cont.)

- History of Performance Issues and Corrective Actions (cont.)
  - Dec 12, 2000 - Low hydraulic ratchet forward stroke pressure alarm occurred due to failure of accessory compartment heater to operate. Contactor coil for heater feed was replaced.
  - April, 2001 - EX2000 exciter failure during startup due to a failed I/O terminal board in the EX2000. The terminal board was replaced.
  - August, 2001 - Inverter failure. Replaced circuit board.
  - September, 2001 - Ratchet failure due to bad limit switch. Limit switch replaced

CTG Availability (cont.)

- Planned/Completed Actions (current Mrule a(1) Get Well Plan)
  - Inspected all original cables, similar to failed cable in Dec, 2000, for splices.
  - Performed review of original equipment to determine where enhancements for long term reliability can be made. Original MCC and associated feed breaker for CTG MCC's refurbished.
  - Install a new redundant CTG.
    - » Adds a new, redundant CTG, not relying on single CTG.
    - » Coordinated with new 120 KV swyd to replace Fermi 1 equip and obsolete switchgear.
    - » Project plan and schedule being developed.

EDG Availability

- Statement of Current Performance against established criteria
  - MR Performance Criteria and Current Performance at the end of July 2001
    - Conditional Probability >= 92%
    - **EDG 11 Actual CP = 97.54%**
    - **EDG 12 Actual CP = 95.98%**
    - **EDG 13 Actual CP = 97.09%**
    - **EDG 14 Actual CP = 31.65%**
    - < 3 Failures in Last 20 Demands
    - **EDG Actual on a system basis = 0 Failures**

EDG Availability

- MR Performance Criteria and Current Performance at the end of July 2001 (cont.)
  - < 5 Failures in Last 50 Demands
  - **EDG Actual on a system basis = 2 Failures**
  - < 8 Failures in Last 100 Demands
  - **EDG Actual on a system basis = 3 Failures**
  - <= 3 MPFF/2 cycles
  - **EDG Actual on a system basis = 4 Failures**

- **Conclusion: Fermi is last in the industry in EDG performance**

EDG Availability (cont.)

- History of EDG Performance Issues
  - Outages (Safety System Outages and Support System Unavailability) - 11.2% of Total Unavailability
    - Higher than industry norm
    - Safety System Outage performance is a station focus area (INPO AFI)
      - » Indicative of outage, work management, work control performance
      - » Contributes to EDG, HPCI, RCIC, RHR availability performance deficiencies.
  - Fault Exposure Hours
    - Mixed Oil Issues (8.2% of total unavailability)
    - EDG-14 Bearing Failure (72.2% of total unavailability)

EDG Availability (cont.)

- Mixed Oil Issues (Level 1 CARD)
  - All Corrective Actions Complete
    - Oil samples taken each time oil change is performed (on risk significant and other important equipment)
    - Oil barrels sampled (label verification)
    - Improved labeling on equipment and containers
    - Peer checks on all fill containers, oil type verifications, oil additions
    - Eliminated satellite oil lockers (now only one)
  - Effectiveness of Actions
    - Since corrective actions have been put in place 7/15/00, no recurrence
    - One individual performance issue has occurred

EDG Availability (cont.)

- EDG 14 Bearing Failure
  - Root Cause:
    - Design modification process improperly used in 1984, allowing EDG oil sight glass piping configuration to be incorrectly modified and left uncorrected.
    - Process used by System Engineering to install oil operating bands did not provide adequate direction and control for green band installation
  - Corrective Actions:
    - NRC reviewed all corrective actions and concluded that they were acceptable.

EDG Reliability Improvement

- EDG Reliability Review Self Assessment
  - Sponsored by Mrule Expert Panel
  - Conducted 05/03/01 through 06/28/01
  - Team Conclusions
    - Overall current system health is adequate to maintain design basis requirements.
    - Process weaknesses were identified. (e.g., extent of condition, rigor of documentation, repeat issues)
    - Enhancements to EDG PM, testing, and system monitoring can improve EDG Reliability.
    - The previous Get Well Plan did not bring about desired EDG performance improvements.

EDG Reliability Improvement

- Team Conclusions (cont.)
  - Human performance improvements will be realized when identified configuration control issues and implementing procedure and training enhancements are made.

EDG Reliability Improvement

- EDG Reliability Improvement Team
  - 6 Team Member Team (Eng, Ops, Maint, WC)
  - Elec SE Supervisor - Lead
  - Charter -
    - Implement recommendations of EDG Reliability Review SA
    - Correct all other short-term reliability issues outstanding on the EDG's
    - Ensure plant processes have all EDG long term reliability issues scheduled for implementation

EDG Reliability Improvement

- EDG Reliability Improvement Team (cont.)
  - Scope of Work and Progress to Date
    - 225 EDG CARD's (190 currently open)
    - 35 CARD's closed, 65 Reliability CARD's identified, 21 dispositioned with CA's defined
  - Developing man-loaded schedule (to completion)

Engineering Excellence Plan

- Purpose
  - Identify site engineering performance gaps so that actions can be implemented to attain engineering excellence
- Methodology
  - Review NRC, QA, ISEG, NSRG, Self Assessment, INPO/WANO Reports, CARD's
  - Interview and survey site personnel (> 200)

Engineering Excellence Plan

- Methodology (cont.)
  - Classify findings against INPO Performance Objectives (EN.1 through 5, PS.1/2, OE 1/2)
  - Compare against "precursors to weak engineering performance"
  - Identify performance gaps and strengths
- Findings
  - 15 Strengths, 52 Areas for Improvement

Standby Feedwater Pump

- Issue Statement
  - On July 26, 2001, the NRC resident found that oil level in the West Standby Feedwater Pump outboard motor bearing housing was not visible, whereas the oil level in the indicators for the East pump were half full.
- Actions Taken
  - Performed tests, analyses and inspections to assure system operability.
  - Revised Op's rounds such that oil levels are verified once per shift.

Standby Feedwater Pump

- Actions Taken/Planned (cont.)
  - Inspections and tests were performed.
    - Found abnormal oil flows to west pump inbd/otbd bearings, but sufficient for operability.
    - Found/repaired "cocked" orifice in the inboard brg. supply line.
    - Verified positive feed to bearings (force feed)
  - Assessing the cause of the oil level changes with vendor support.

Other Actions

- Additional Actions to Improve Equipment Oil Monitoring and Control
  - Professional placards will be installed on appropriate plant rotating equipment with accessible level indicators.
    - Appropriate design configuration verifications will be performed.
  - Pre-startup checklists/instructions will be added to procedures
  - Training needs will be assessed to ensure adequate knowledge of oil issues are present.