

3-6

**WESTINGHOUSE PRESENTATION TO CON EDISON ON THE STATUS OF STEAM GENERATOR CONDITIONING MONITORING AND OPERATIONAL ASSESSMENTS OF THE INDIAN POINT UNIT 2 STEAM GENERATORS**

**DATE: APRIL 14, 2000  
TIME: 8:00 A.M. TO 9:30 A.M.**

**INSPECTOR ASSESSMENT WAS THAT NUMEROUS CONCERNS FROM CON EDISON, EPRI INVOLVED THE ABILITY TO PREDICT CRACK GROWTH RATE AND CONFIDENCE IN ANALYSIS OF THE CURRENT DATA**

**ATTENDEES: CON EDISON, WESTINGHOUSE, INPO REPRESENTATIVE, EPRI, AND STATE OF NY PUC**

**1. A GENERAL OVERVIEW OCCURRED CONCERNING THE DIFFERENCE BETWEEN CONDITION MONITORING AND OPERATIONAL ASSESSMENT. CONDITION MONITORING EVALUATES IF PERFORMANCE CRITERIA WERE ACHIEVED IN THE PAST, AND OPERATIONAL ASSESSMENT EVALUATES FUTURE ASSURANCE THAT ALL DEFECTS IN STEAM GENERATORS WERE DETECTED AND THOSE LEFT IN SERVICE WOULD NOT GROW TO IMPACT SIGNIFICANTLY STRUCTURAL MARGINS.**

**2. COMPLICATIONS AT IP2 DURING THIS STEAM GENERATOR TEST/MAINTENANCE PROGRAM HAVE BEEN THE INFLUENCE OF SECONDARY SIDE COPPER ON THE TUBES, NDE QUALIFICATION STANDARDS, AND SUPPORT PLATE DEGRADATION.**

**THE NEXT AREA WITHIN THE PRESENTATION CONCERNED VARIOUS AREAS WITHIN THE STEAM GENERATOR**

**A. LOW ROW U-BEND AREA**

**-R2C5 TUBE (CAUSE OF 2/15) EVENT WOULD NOT HAVE BEEN IDENTIFIED USING THE 1997 STANDARDS**

**-WESTINGHOUSE BELIEVES THAT THE PROBABILITY OF DETECTION (POD) HAS IMPROVED IN THIS STEAM GENERATOR AREA DUE TO INCREASE FOCUS ON NDE GUIDELINES, IMPROVEMENTS TO SIGNAL/NOISE USING THE 800KHTZ PROBE (USE OF DATA EXAMPLE FOR 24 STEAM GENERATOR R2C69 TUBE), AND THAT HIGHER FREQUENCY PROBES FOUND SOME ADDITIONAL INDICATIONS. WESTINGHOUSE DID MENTION THAT HIGHER FREQUENCY PROBE WAS NOT EFFECTIVE FOR OUTSIDE DIAMETER DEFECTS.**

**- WESTINGHOUSE TOOK ISSUE WITH THE NRC'S RESEARCH LETTER IN THAT THE DISTRIBUTION CURVES WERE NORMALIZED AND DID NOT ACCOUNTING FOR THE VARIABILITY IN STEAM GENERATOR CONDITIONS AT OTHER FACILITIES. HOWEVER, EPRI PERSONNEL INDICATED THAT THE DISTRIBUTION ARGUMENTS WITHIN THE RESEARCH LETTER WERE VALID AND DID APPLY TO IP2**

**-WESTINGHOUSE HAS COMMITTED TO PERFORM FURTHER LABORATORY ANALYSIS TO QUANTIFY THE POD ISSUE AT THE U-BENDS IN THE FUTURE. CON EDISON STATED SOME EFFORT WAS ALREADY UNDERWAY AT CATHOLIC UNIVERSITY.**

**-WESTINGHOUSE PRESENTED THAT THE HIGHER FREQUENCY PROBES PROVIDED SIGNIFICANTLY BETTER DATA THAN THE LOWER FREQUENCY PROBES**

*[Handwritten signature]*

- TOTAL OF EIGHT INDICATIONS AT THE U-BEND
- CON EDISON CHALLENGED WESTINGHOUSE ON THE QUALITY OR LEVEL OF CONFIDENCE OF ANALYTICAL CONCLUSIONS BASED UPON A RECENT TUBE WHEREAS ONLY ONE OF FOUR ANALYSIS CONCLUDED IT WAS A FLAW. WESTINGHOUSE RESPONDED THAT ANALYSIS REPEATABILITY IS MINIMIZED BY DIFFERENT NDE (I.E. UT, IN-SITU TESTING, AND MORE DATA BEING TAKEN)
- THE ANALYSIS HAS TO BE ABLE TO CONCLUDE THAT THE LARGEST UNDETECTED FLAW IS NOT STRUCTURALLY SIGNIFICANT. THE METHOD WESTINGHOUSE PLANS TO EMBARK UPON IS TO COMPARE DATA WITH 1997 USING TUBE R2C5 AS BOUNDING, AND HISTORICAL DATA FROM OTHER FACILITIES
- EPRI AND CON EDISON HAD MANY QUESTIONS ON PREDICTABILITY OF GROWTH RATE. EPRI WAS COMMENTING THAT TUBE R2C5 WAS DIFFICULT TO SIZE IN 1997 SO HOW CAN THIS BE USED FOR PREDICTABILITY.
- EPRI COMMENTED THAT FLAW LENGTH SHOULD BE MORE OF A INPUT INTO GROWTH SIZE THAN FLAW DEPTH.
- WESTINGHOUSE PROVIDED SOME CURVES ON PROBABILITY OF DETECTION VS. PERCENTAGE OF THROUGH-WALL. CONCLUSION WAS THAT INDUSTRY WAS BETTER AT DETECTION AT THE DENT LOCATIONS THAN CON EDISON. CON EDISON'S DATA WAS THAT EIGHT CALLED INDICATIONS AT THE U-BEND.
- WESTINGHOUSE STATED THAT NOT A LOT OF DATA EXISTS AT THE U-BEND, SINCE PLANTS PREVENTATIVELY PLUGGED ROW 1, HEAT TREATED OTHER ROWS.
- IN-SITU TESTING RESULTS WERE DISCUSSED: A CHART WAS PROVIDED ON ALL EIGHT TUBES SUBJECTED TO IN-SITU TESTING. THE CONCLUSION WAS THAT ALL MET THE CRITERIA OF 1.1 x MSLB PRESSURE WITH LESS THAN 1 GPM LEAKAGE.
- OPEN QUESTIONS ON HOW TO PREDICT PERFORMANCE AND GROWTH RATE FOR ROW 3 TUBES GIVEN THAT ROW 2 TUBES WILL BE REMOVED FROM SERVICE.

#### B. SLUDGE PILE

- CONFIRMED THAT CECCO AND PLUS POINT PROBES HAD GOOD CONFIRMATION DURING QUALIFICATIONS, HOWEVER AT IP2 SLUDGE PILE REGION SIGNIFICANT DIFFERENCE BETWEEN CECCO AND PLUS POINT. ULTRASONIC MEASUREMENTS WERE TAKEN THAT CONFIRMED THAT PLUS POINT WAS CALLING THE CORRECT DEFECTS
- 11 TUBE INSITU TESTED WITH ONE LEAK.

#### C. AREA ABOVE SLUDGE PILE

- COPPER INFLUENCES ON ECT: TWO APPROACHES TO USE ULTRASONIC FROM TOP OF TUBE SHEET TO 1<sup>ST</sup> SUPPORT PLATE. THE SCOPE WILL BE TO PERFORM PLUS POINT IN 2 STEAM GENERATORS WITH A 20% SAMPLE. THIS WILL PROVIDE THE LARGEST VERTICAL HEIGHT FOR THE DEFECT. THE SAMPLE WAS THEN EXPAND TO 100% FOR HOT LEG ON ALL STEAM GENERATORS UP TO THIS MAXIMUM VERTICAL HEIGHT. ANOTHER SAMPLE WILL BE 2 OUT OF 4 STEAM GENERATORS TO REINSPECT 20% OF THE TUBES TO THE TOP OF THE TUBE SHEET.

#### D. CREVICE REGION

- WESTINGHOUSE BELIEVES NO CONCERN FOR BURST CAPABILITY OF TUBES
- WESTINGHOUSE CONCERNED WITH RECENT INDICATION THAT HAD GROWTH FROM

AN IN-SITU TEST THAT APPARENTLY DID NOT MEET THE CRITERIA.  
-GOOD AGREEMENT WITH PLUS POINT AND CECCO PROBES IN THIS REGION.  
-WESTINGHOUSE COMMENTED THAT NOT MANY PARTIALLY ROLLED STEAM  
GENERATORS CURRENTLY EXIST IN THE INDUSTRY.

#### MISCELLANEOUS

WESTINGHOUSE IS HAVING ALTRAN PERFORM STRUCTURAL ASSESSMENTS OF THE  
SUPPORT PLATES.

WESTINGHOUSE PLANS TO HAVE A PARTIAL DRAFT ANALYSIS OF THE OPERATIONAL  
ASSESSMENT (SPECIFICALLY U-BEND ANALYSIS) TO CON EDISON NEXT WEEK FOR  
REVIEW.