U. S. NUCLEAR REGULATORY COMMISSION

REGION III

Report No. 50-454/84-39; 50-455/84-28

Docket No. 50-454; 50-455 License No. CPPR-130; CPPR-131

Licensee: Commonwealth Edison Company
Post Office Box 767
Chicago, IL 60690

Facility Name: Byron Station, Units 1 & 2

Inspection At: ITT-Grinnell Corporation, Warren, OH
ITT-Grinnell Corporation, Providence, RI

Inspection Conducted: June 8, 27-28, and July 27, 1984

Inspector: I. T. Yin 8/16/84
Date

Approved By: D. H. Danielson, Chief
Materials and Processes Section 8/17/84
Date

Inspection Summary

Inspection on June 8, 27-28, and July 27, 1984 (Report No. 50-454/84-39(DRS); 50-455/84-28(DRS))
Areas Inspected: Special announced followup inspection of testing of the large bore Boeing steam generator snubbers. The inspection involved a total of 24 inspector-hours at the ITT-Grinnell test facility and design engineering office.
Results: No items of noncompliance or deviations were identified.

DETAILS

1. Persons Contacted

Commonwealth Edison Company (CECO)

*E. D. Swartz, Nuclear Licensing Administrator
*P. R. Donavin, Field Engineering Coordinator
*H. M. Jensen, Consultant
B. Koehler, Engineer - Technical Staff

Sargent and Lundy Engineers (S&L)

*S. Putman, Supervising Structural Engineering Specialist
*R. A. Salsbury, Mechanical Engineer

ITT-Grinnell Corporation (ITT-G)

*R. B. Mulcahey, Vice President and Director of Engineering
*D. M. Sewell, Vice President and Director of QA
*E. R. Eramian, Engineering Manager - Field Service
*A. M. Guglielmo, Assistant Engineering Manager - Field Services
*R. K. Taylor, Project Manager - Contract Administration
*D. W. Mills, Senior Project Engineer
*D. L. Jew, Analysis Section Leader

*Denotes those attending the management exit meeting on July 27, 1984.

2. Functional or Program Areas Inspected

a. Historical Information

(1) RIII's Byron inspection (Inspection Report No. 50-454/83-20; 50-455/83-17) conducted in May 1983 identified steam generator snubber (SGS) leakage, CECO's lack of protective measures and surveillance of snubber conditions, and deficiencies in Boeing qualification test reports.

(2) RIII's Byron inspection (Inspection Report No. 50-454/84-08; 50-455/84-06) conducted in January 1984 documented a special meeting held with CECO and S&L Engineers. CECO concurred with RIII on January 27, 1984, that tests would be conducted to re-qualify the Boeing SGSs.

(3) CECO's letter to RIII dated February 23, 1984, provided S&L Consultant Specification No. 120, "Testing Services for SGSs," issued on February 22, 1984.

(4) RIII's letter dated March 7, 1984, requested (a) an opportunity to review the testing procedures, and (b) sufficient notification be provided to allow RIII an opportunity to observe the facility and testing.

(5) Various telephone conferences were held in April and May 1984. RIII commented on preliminary test procedures. Revisions to the procedures were made to accommodate the RIII comments.

(6) ITT-G Test Procedure SPS-8416-1-2, "Functional and Spring Rate Testing of SGSs," Rev. 1, dated May 18, 1984, was reviewed and concurred in by RIII on May 31, 1984.

(7) ITT-G SPS-8416-1-2, Rev. 2, dated June 4, 1984, was reviewed and concurred in by RIII on June 6, 1984.

(8) RIII inspected the ITT-G test facility at Warren, Ohio, on June 8, 1984, and requested that: (a) all tests including equipment shake down and instrument calibration be witnessed by a third party inspector, such as an ANI, (b) test data and inspection records be forwarded to RIII upon completion of the testing of the first SGS, and (c) RIII be informed of any schedule deviation and difficulties.

(9) SGS No. 23 failed the test on June 19, 1984.

(10) SGS No. 14 failed an investigative test on June 21, 1984.

(11) SGS No. 14 failed the test on June 25, 1984.

(12) RIII inquired of test status on June 25, 1984. CECO informed RIII of the testing problems.

(13) SGS No. 10 failed the test on June 28, 1984. A 10 CFR 50.55(e) report was submitted to the NRC by CECO.

(14) A design meeting was held at ITT-G, Providence, RI, on July 27, 1984, to discuss proposed SGS design and hardware modifications.

b. Tests Performed

The steam generator snubbers that were tested were units furnished for the Braidwood Station. The Braidwood snubbers are identical to the Byron snubbers and they were also furnished by Boeing. As the steam generator snubbers for Byron are installed in place, Region III agreed testing of Braidwood snubbers was acceptable.

Various SGS lock-up and bleed-rate tests were performed.

(1) During the test conducted on June 19, 1984, for Snubber No. 23, the following conditions were observed by the licensee's technical representatives:

(a) Compression Test

Not done.

(b) Tension Test

1 Lock-up Velocity (LV) was measured at 6.5 in./min. This is within Specification range of 5 to 7 in./min.

2 Bleed Rate (BR) measurements exceeded Specification. Mechanical defects identified. The Specification range is for 260 Kips the BR = 0.25 in./min; 770 Kips the BR = 0.30 in./min; 1,950 Kips the BR = 0.37 in./min.

a At 298.4 Kips (12.4% of Rated Capacity (RC)), BR = 0.48 in./min. No leaks observed.

b At 734.2 Kips (30.6% RC), BR = 1.84 in./min. One of the eight retainer ring bolts popped out. Fluid burst out. Subsequent examination found that the retainer ring was bent, and the remaining seven bolts were bent.

(c) Torquing of the Gland Nut

Torquing record at Braidwood showed 1,200 ft-lb.

(2) During the investigative test conducted on June 21, 1984, for Snubber No. 14, the following conditions were observed:

(a) No LV & BR tests were performed.

(b) Gland seal nut was torqued to 2,400 ft. lbs.

(c) At 100 Kips (4.2% RC) on the tension side. Steady stream of fluid was observed at the gland nut thread location.

(d) At 200 Kips (8.4% RC). Fluid was bursting out at the chevron wiper location.

(3) During the test conducted on June 25, 1984, for Snubber No. 14, the following conditions were observed:

(a) Compression Test

1 LV was measured at 5 in./min. This is within specification.

2 At 72.4 Kips (3% RC), BR = 0.01 in./min. No leaks observed.

3 At 325.7 Kips (13.6% RC), BR = 0.09 in./min. No leaks observed.

4 At 778.1 Kip (32.4% RC), BR = 0.12 in./min. Fluid containing black substance was forced from the cylinder compression end. It was estimated to be 10 to 20 drops. The condition did not persist when loading was held at the same level.

(b) Tension Test

1 LV was measured at 6.2 in./min. This is within the specification.

2 At 79.1 Kips (3.8% RC), BR = 0.14 in./min. Steady stream of fluid flow was observed at piston rod area.

3 At 235.8 Kip (9.8% RC), BR = 0.84 in./min. Fluid was bursting out at the chevron wiper area.

4 Subsequent examination found the retaining rings, bolts, chevron seals, and the pressure seal ring set in working condition.

(c) Torquing of the Gland Seal Nut

Gland seal nut was torqued to 1,600 ft. lb. originally. It was torqued to 2,400 ft. lb. prior to the test.

(4) Snubber No. 10, was tested on June 28, 1984. The test data confirmed the SGS design problem.

(a) Tension Test

1 LV = 7.2 in./min. Small leakage was identified.

2 At 248 Kips (10.3% RC), BR = 1.35 in./min. Fluid started to burst out of the gland nut area.

3 At 603 Kips (25.1% RC), BR 5.2 in./min. Large quantity of fluid continued to burst out.

(b) Compression Test

1 LV = 6.6 in./min. No leaks observed.

2 At 316 Kips (13.2% RC), BR = 0.16 in./min. Did not check for leaks.

3 At 751 Kips (31.3% RC), BR = 0.7 in./min. Fluid was bursting out of compression cylinder seal.

c. Timely Reporting of the Snubber Problems

Since June 19, 1984, the licensee has stopped using normal testing procedures. The June 21 and 25, 1984, tests were conducted to try and determine the cause of the problem and seek ways to improve the situation.

The problem observed on June 19, 1984, was not communicated to RIII in a timely manner. It was not until the inspector's telephone call to the CECO Licensing Administrator on June 25, 1984, inquiring about the testing status that the problem was brought to RIII's attention. CECO management policy on reporting safety significant problems will be reviewed by the staff. This is an unresolved item (454/84-39-01; 455/84-28-01).

d. Technical Evaluation

As of June 27, 1984, the review to determine the cause of the identified problem revealed the following issues related to the SGS design:

(1) The brass type seal ring working with the pair of steel compression rings could not seal the fluid under pressure. The fluid could pass through the seal ring and piston rod, seal ring and compression rings, or compression rings and snubber cylinder block.

(2) The combination of the metallic "C" ring and the application of sealant on the gland nut threads to stop the low pressure fluid leak appears to be unworkable for the following reasons:

(a) Metallic "C" ring is of no value in sealing fluid at low pressure.

(b) The uniform application of sealant on threads cannot be assured due to the large diameter (10") piston rod threading surface area.

(3) The use of all metal seals in the tension cylinder, compression cylinder, and piston area appear to be questionable. Fluid leakage during the compression test and bursting of the fluid during the tension test loading conditions were observed.

(4) Material compatibility between Dow Corning DC200-50 Silicone fluid and the new gland nut thread sealant, Dow Corning Silastic No. 732 RTV, needs review.

(5) Per Boeing Drawing D275-N0201, Rev. E, dated September 7, 1979, the torquing of the gland seal nut should be 1,100 to 1,200 ft. lb. The Boeing Installation and Maintenance Instructions dated August 10, 1978, stated that it should be torqued to maximum of 2,400 ft. lb. if leaking is identified. Tests showed that neither 1,600 ft. lb. nor 2,400 ft. lb. could prevent fluid from bursting out of the snubber.

(6) The absence of snubber fluid filtering devices installed internally and externally appears to be a potential long range problem. Past experience with ITT-G snubbers indicates fluid contamination can affect the functioning of the snubber. This finding caused ITT-G to re-design SGSs to include filters at the fluid reservoir and at the bleed nozzle.

e. Design Meeting

A meeting was held by the licensee on July 27, 1984, at the ITT-G corporate design engineering headquarters to discuss the ITT-G proposed SGS modifications. The inspector concurred with the ITT-G and S&L presentations with the condition that the following items will require RIII review and observation in the future and will be considered an unresolved item (454/84-39-02; 455/84-28-02):

(1) Structural test to be performed to verify cylinder end cap flange assembly modification design calculations.

(2) Seal leak test to be conducted for the piston seal assembly to determine the existing Boeing design adequacy.

(3) Documentation of material compatibility between the Dow Corning fluid and Viton or Ethylene Propylene seals (replacement of metallic seals).

(4) S&L ECN 22221, "Consultant Specification No. 120, Amendment 1".

(5) SGS re-qualification program.

(a) Technical provisions.

(b) QA measures.

(c) Third party inspection.

3. Unresolved Items

Unresolved items are matters about which more information is required in order to ascertain whether they are acceptable items, items of noncompliance, or deviations. Unresolved items disclosed during this inspection are discussed in Paragraphs 2.c and 2.e.

4. Exit Interview

The inspector met with those licensee representatives denoted in Paragraph 1 at the conclusion of the inspection. The inspector summarized the scope and findings of the inspection. The licensee acknowledged the findings reported herein.

Commonwealth Edison
One First National Plaza, Chicago, Illinois
Address Reply to: Post Office Box 767
Chicago, Illinois 60690

August 13, 1984

Mr. Harold R. Denton, Director
Office of Nuclear Reactor Regulation
U.S. Nuclear Regulatory Commission
Washington, DC 20555

Subject: Byron Generating Station Unit 1
Construction Permit CPPR-130
NRC Docket No. 50-454

Reference (a): October 12, 1982 letter from
D. G. Eisenhut to L. O. DelGeorge.

Dear Mr. Denton:

Extension of the Byron 1 construction permit is hereby requested. This change is necessary because of uncertainty in the schedule for completion of the operating license hearing and subsequent issuance of the operating license.

Every effort is being made to complete construction and testing of Byron 1 for fuel load by September 15, 1984. As indicated in reference (a), the latest construction completion date specified in the Byron 1 construction permit is October 1, 1984. This appears to be adequate from a construction standpoint. It may not be adequate, however, with regard to completion of the reopened operating license hearing and issuance of the operating license. Extension of the construction permit is therefore being requested in light of the uncertainty in the completion of the NRC licensing process.

Although it is impossible to predict when the operating license will be issued, we hope that a three month extension of the Byron 1 construction permit will cover all eventualities. It is therefore requested that the latest construction completion date specified in CPPR-130 be revised pursuant to 10 CFR 50.55(b) from October 1, 1984 to January 1, 1985. This amendment does not involve a significant hazard consideration and has no significant environmental impact.

Please contact this office if additional information regarding this matter is required.

Recd w/ check
#9012070 for $150.00

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Three signed originals and thirty-seven copies of this letter are provided for NRC review. A check in the amount of $150.00 is also submitted in accordance with the requirements of 10 CFR 170.12(b).

Very truly yours,

D. L. Farrar
Director of Nuclear Licensing

SUBSCRIBED AND SWORN to
before me this 13th day
of August, 1984

Notary Public

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Commonwealth Edison
One First National Plaza, Chicago, Illinois
Address Reply to: Post Office Box 767
Chicago, Illinois 60690

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July 9, 1984

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U.S. NUCLEAR REGULATORY COMMISSION
NMSS
Mail Section

Mr. J. G. Davis, Director
Office of Nuclear Material Safety
and Safeguards
U.S. Nuclear Regulatory Commission
Washington, DC 20555

Expires Aug 31, 1984

Docket 70-2906

Subject: Request for Extension of License
SNM-1860 for Byron Station Units 1 and 2
NRC Docket Nos. 50-454/455

Dear Mr. Davis:

Pursuant to 10 CFR Part 70, Commonwealth Edison Company hereby requests a six month extension for license SNM 1860 covering incore monitoring detectors at Byron Station.

The operating license for Byron 1 was initially denied on January 13, 1984, however, on appeal a remand hearing was ordered. The reopened hearing is scheduled to commence July 23, 1984 and terminate around the end of August. Without an extension it is anticipated that the SNM license would expire before an operating license is issued. We hope that an operating license will be issued soon after the hearing is over, but are requesting a six month extension to cover all contingencies.

Pursuant to 10 CFR 170.31, Commonwealth Edison Company has determined that no fee is required.

Please address any questions that you might have to this office.

Very truly yours,

Greg Alexander

Greg Alexander
Nuclear Licensing Administrator

cc: N. Ketzlach - NMSS

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