



R. F. Burski
Director
Nuclear Safety
Waterford 3

W3F1-96-0012
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PR

February 8, 1996

U.S. Nuclear Regulatory Commission
ATTN: Document Control Desk
Washington, D.C. 20555

Subject: Waterford 3 SES
Docket No. 50-382
License No. NPF-38
Supplemental Information for Relief Request RR ISI-015, Use of
Tubing without Code Certification in Essential Chiller Evaporator Heat
Exchanger

Gentlemen:

The purpose of this letter is to provide supplemental information pursuant to a letter to the Document Control Desk, dated April 28, 1995, requesting ISI code relief for use of tubing in the Waterford 3 Essential Chiller Evaporator Heat Exchanger B. This letter will provide information to address concerns raised during conversations with the NRC staff in the following areas: a) Safety consequences of chiller tubing failure, b) Sequence of Events, and c) Tube testing methodology.

a) Safety Consequences Of Tubing Failure

The Essential Chilled Water system consists of three (3) 100 percent capacity chiller subsystems designed to supply 42°F chilled water to safety systems via two (2), (train 'A' and train 'B') independent system trains. The third chiller (chiller compressor 'A/B') is a "swing" chiller which can supply chilled water to either the 'A' train or the 'B' train, depending on the electrical supply and valve alignment. Each chiller subsystem and train consists of: one water chiller compressor unit, one chilled water pump, and associated piping, valves, instrumentation and controls.

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These chilled water trains are piped such that chilled water is circulated, from any two (2) of the chiller subsystems, through (3) three chilled water supply loops Safety Train 'A', Safety Train 'B' and Non-Nuclear Safety Train, which serve equipment in various parts of the Reactor Auxiliary Building. Two (2) of the three (3) loops serve safety-related air handling units.

The third loop serves non-safety air handling units. During a design basis accident, the non-safety loop is isolated from the remainder of the system and the two (2) safety-related loops are isolated from each other so that each operating subsystem serves a safety-related loop while the non-safety loop receives no chilled water.

The system is designed with complete component redundancy and isolation features to assure that chilled water will be provided to 'A' or 'B' train piping loops following a design basis accident assuming a single failure in any one operating train.

The tubing discussed in this issue is only installed in the evaporator heat exchanger section of the Essential Chiller 'B' compressor. If the tubing in the 'B' Essential Chiller evaporator heat exchanger were to fail while operating, water would enter the refrigerant system. Each chiller unit has a dehydrator subsystem which will separate the water from the refrigerant circuit. The dehydrator system would collect the water and give a positive indication through a sightglass indicator. Failure of the 'B' chiller subsystem will not adversely impact the operation of the Essential Chilled Water system since the Chilled Water System has a 100 percent capacity "installed spare" by way of the "swing" ('A/B') Chiller subsystem. The 'A/B' Chiller subsystem may be readily substituted to supply either the 'A' or the 'B' train of Chilled Water.

Although the tubes replaced in Essential Chiller 'B' evaporator heat exchanger were supplied by a vendor without a Quality System Certificate, the Certified Material Test Report (CMTR), the vendor's quality assurance program, the excellent three year performance history since replacement, and the dehydrator system circuit indicating there has been no tube leakage, provides evidence that the tubing and thus the chiller unit can continue to perform its intended design and safety functions. Therefore, the nuclear safety capabilities of the Essential Chiller 'B' are not degraded and the tubes continue to provide an acceptable level of quality and safety.

b) Sequence of Events:

The following details the sequence of events from the time the tubes were manufactured to the time of certification.

5/4/89 Waterford 3 Purchase Order required:

412 tubes, part number 19EA41-5713-39NU (Wolverine Production Order Number 418701); 384 tubes, part number 17FA153-1002-7NU (Wolverine Production Order Number 418601)

7/21/89 Letter to Wolverine Tube, Inc. from United Technologies Carrier documenting results of a Carrier audit:

The letter states in part: "...The purpose of this audit was to verify, through review of your Quality Assurance Program, records and observations, work activities, the effectiveness and compliance to the requirements of 10CFR.50 Appendix B and 10CFR21 as it related to the Carrier Corporation Generic Nuclear Qualification Program."

"...Based on this audit and Wolverine Tubes excellent past performance as a supplier of tubing material to Carrier Corporation, Wolverine Tube will remain on Carrier's Generic Nuclear Qualification Approved Vendors List."

9/2/89 Certified Material Test Report (CMTR) provided by Wolverine Tube to Carrier Corporation (P/N 17FA153-1002-7NU, Wolverine Production Numer 418601). CMTR states:

Lot number 1, 384 tubes, customer drawing 17FA153-1002-7NU.
ASTM SB359 Type 122 Copper.
Chemical Anlaysis performed on production lot.
Mechanical Properties performed.
Eddy Current performed (before and after finning).
Pneumatic Test performed (250 psig after finning).
Flattening Test performed (before finning).
Expansion Test performed (before finning).

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Statement on CMTR states: "This material was produced in accordance with Wolverine Tube, Inc. Quality Assurance Program; As audited by Carrier Corp. as conforming to the requirements of ASME Section III, NCA3800."

9/9/89 Certified Material Test Report (CMTR) provided by Wolverine Tube to Carrier Corporation (P/N 19EA41-5713-39NU), Wolverine Production Numer 418701). CMTR states:

Lot number 1, 412 tubes, customer drawing 19EA41-5713-39NU.
ASTM SB359 Type 706 Copper/Nickel.
Chemical Analysis performed on production lot.
Mechanical Properties performed.
Eddy Current performed (before and after finning).
Pneumatic Test performed (250 psig after finning).
Flattening Test performed (before finning).
Expansion Test performed (before finning).

Statement on CMTR states: "This material was produced in accordance with Wolverine Tube, Inc. Quality Assurance Program; As audited by Carrier Corp. as conforming to the requirements of ASME Section III, NCA3800."

9/25/89 Tubes were receipt inspected at Carrier Corporation (Syracuse, NY). Carrier established the part numbers and established the Carrier job number for Waterford 3 Purchase Order;

Item 001, 384 tubes P/N 17FA153-1002-7NU
Item 002, 412 tubes P/N 19EA41-5713-39NU
Carrier Job Number D64019306
Waterford 3 Purchase Order WPO24806 Rev. 1.

10/23/89 Waterford 3 received tubes with Certificate of Conformance from Carrier Corporation.

3/6/92 Tubes were installed into the 'B' Chiller without the appropriate code documentation.

1/10/95 Remaining tubes with the original tagging on the original boxes are placed in crates and returned to Wolverine Tubes, Inc.

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1/11/95 Entergy, Carrier Corp., and Wolverine representatives met at Wolverine (Decatur, Ala.) and inspected the original boxes that the tubes originally arrived in. Based on the inspection, Wolverine Tubes, Inc. acknowledges the original Wolverine tags are still in place on the boxes. The tubes were then counted and inspected for damage.

410 tubes, P/N 19EA41-5713-39NU

261 tubes, P/N 17FA153-1002-7NU

1/17/95 Letter from Wolverine Tube, Inc. to Consolidated Power Supply states in part: "...Section 2 Upon reconveyance and delivery by Carrier of the subject product to it, Wolverine agrees to perform the following test and inspection upon subject product:

- A) Visual Inspection (100 percent of all tubes)
- B) Eddy Curren⁺ Inspection (100 percent of all tubes)
- C) Air Pressure Test (100 percent of all tubes)
- D) Chemical Analysis (1 sample per lot)"

1/25/95 A letter was sent to Waterford 3 from Carrier Corporation stating that the 384 tubes of P/N 17FA153-1002-7NU and the 412 tubes of P/N 19EA41-5713-39NU were from the same lot.

2/20/95 Certificates of Compliance were received for Consolidated Power Supply stating:

246 tubes (13 rejected for dimensions, 1 destroyed for chemical analysis, 1 unknown), P/N 17FA153-1002-7NU, meet the requirements of ASME Section III Class 3 1974 Edition Summer 1975 Addenda.

409 tubes (1 destroyed for chemical analysis), P/N 19EA41-5713-39NU, meet the requirements of ASME Section III Class 3 1974 Edition Summer 1975 Addenda.

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c) Testing Methodology

The original tube lot, was tested by Wolverine Tubes, Inc. The testing included the following:

Lot number 1, 384 tubes, customer drawing 17FA153-10L2-7NU, ASTM SB359 Type 122 Copper, Production Order Number 418601;

Chemical Analysis performed on production lot.

Mechanical Properties performed.

Eddy Current performed (before and after finning).

Pneumatic Test performed (250 psig after finning).

Flattening Test performed (before finning).

Expansion Test performed (before finning).

Statement on CMTR states: "This material was produced in accordance with Wolverine Tube, Inc. Quality Assurance Program. As audited by Carrier Corp. as conforming to the requirements of ASME Section III, NCA3800."

Lot Number 1, 412 tubes, customer drawing 19EA41-5713-39NU, ASTM SB359 Type 706 Copper/Nickel, Production Order Number 418701;

Chemical Analysis performed on production lot.

Mechanical Properties performed.

Eddy Current performed (before and after finning).

Pneumatic Test performed (250 psig after finning).

Flattening Test performed (before finning).

Expansion Test performed (before finning).

Statement on CMTR states: "This material was produced in accordance with Wolverine Tube, Inc. Quality Assurance Program. As audited by Carrier Corp. as conforming to the requirements of ASME Section III, NCA3800."

When the certification discrepancy was identified, the remaining tubes were overcrated and returned to Wolverine Tubes, Inc. It was there that the tubes were inspected and verified by representatives from Entergy, Carrier Corp. and Wolverine Tubes, Inc., to be of the same lot of tubes originally purchased by Waterford 3 on WPO24806 Rev. 1.

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Wolverine agreed to perform the following tests on the tubes:

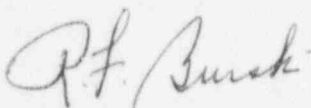
- A) Visual Inspection (100 percent of all tubes).
- B) Eddy Current Inspection (100 percent of all tubes).
- C) Air Pressure Test (100 percent of all tubes).
- D) Chemical Analysis (1 sample per lot).

Waterford 3 issued new Purchase Orders to Consolidated Power Supply, a holder of a Quality Systems Certificate, to re-purchase the tubes. Waterford 3 Purchase Orders WPO61670 for 409 tubes, P/N 19EA41-5713-39NU, and WPO61671 for 246 tubes, P/N 17FA153-1002-7NU. The Purchase Orders required the tubes to meet the requirements of ASME Section III, Class 3, 1974 Edition, Summer 1975 Addenda, ASME Section II, 1974 Edition, Summer 1975 Addenda, 10CFR21 requirements, and 10CFR50 Appendix B. Tubes meeting these requirements were then provided to Waterford 3, as requested.

It is Waterford's belief that since the replacement tubes installed in the 'B' Essential Chiller's heat exchanger are of the same lot as those determined to meet ASME, 10CFR21, and 10CFR50 Appendix B requirements per the Waterford purchase orders WPO61670 and WPO61671, they are also of the same high quality and can continue to perform their intended safety function.

If you have any questions or require further information please feel free to contact P.L. Caropino at (504) 739-6692.

Very truly yours,



R.F. Buriski
Director
Nuclear Safety

RFB/WHP/tjs

cc: L.J. Callan, NRC Region IV
C.P. Patel, NRC-NRR
R.B. McGehee
N.S. Reynolds
D.F. Packer
NRC Resident Inspectors Office