



Commonwealth Edison

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June 25, 1981

Mr. James F. Keppler, Director
Directorate of Inspection and
Enforcement - Region III
U.S. Nuclear Regulatory Commission
799 Roosevelt Road
Glen Ellyn, IL 60137

Subject: Byron Station Units 1 and 2
Cable Tray Stiffener Weld Quality
NRC Dockets Nos. 50-454 and 50-455

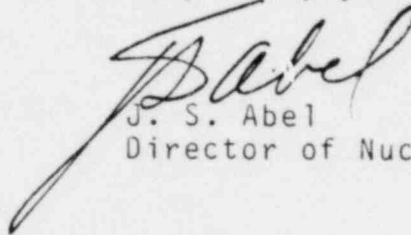
References (a): February 26, 1981, letter from
T. R. Tramm to J. G. Keppler

(b): April 23, 1981, letter from
C. E. Norelius to C. Reed

Dear Mr. Keppler:

Attachment A to this letter provides our response to the NRC questions regarding Byron cable tray stiffener weld quality transmitted in Reference (b). Please address further questions regarding this matter to my office.

Very truly yours



J. S. Abel
Director of Nuclear Licensing

Attachment

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Question 1:

Your "Weld Quality" assumption in Attachment "A", Byron Cable Tray Stiffener Weld Inspection, does not demonstrate an adequate basis to establish that weld size and quality are acceptable. NRC inspectors have observed poor quality welds in installed cable trays. These observations were not documented because our inspectors understood, based on discussions with your staff, that your inspections had identified these issues. Since according to statements in your letter weld size and quality had not been documented as nonconforming, we conclude that your analysis and evaluation are incomplete. Please provide additional evidence of adequate weld quality based on the inspection history of the aforementioned welds or other considerations. Also, please address the discrepant welds on installed cable tray stiffeners observed by NRC inspectors.

Response 1:

For the purpose of assuring completeness in documentation, Commonwealth Edison Company will perform a field inspection for weld size and quality. The same cable tray piece parts inspected during the initial field survey to resolve Commonwealth Edison Company Nonconformance Report F-529 at Byron Station will be reinspected. Deficient welds will be evaluated to determine their acceptability. Where deficient welds are found unacceptable, they will be subtracted from the actual weld length provided and compared to the minimum weld required by design. A summary of the inspection results will be provided as soon as it is available.

Question 2

Your methodology for establishing a random sample as outlined in Attachment "A" is not clear. Please provide a comprehensive description of what was done to establish a random sample. Include in this description the basis for concluding that your sample is representative of the total population.

Response 2:

The field survey was performed by an independent testing agency, Pittsburgh Testing Laboratories, and verified by Commonwealth Edison Company Site Q.A. personnel. The sampling plan shown in Table 1 was established to ensure that a representative set of cable tray sections was selected. All building floor elevations where cable tray exist have been included in the survey, and no specific floor has been favored by inspecting a majority of samples from that evaluation. Both straight sections of cable tray and three different types of fittings were included in the sampling plan at each building floor elevation surveyed. The surveyors were free to select any accessible cable tray section in accordance with the sampling plan.

Since the surveyors were unbiased and since a uniform coverage of all building floor elevations have been included, we believe this sampling plan is without bias and, therefore, random.

Question 3:

It appears that the statistical evaluation of the quality of these cable tray stiffener welds constitutes a change from the acceptance and quality criteria outlined in Section 3.8 (Design of Category 1 Structures) Table 3.8-2, Item No. 20 of the FSAR. Please discuss your intentions and considerations regarding compliance with this FSAR design requirement.

Response 3:

FSAR Section 3.8 does not apply to the design of cable trays. FSAR Section 3.10 indicates that an AISI code was applied to cable tray design but there is no FSAR commitment regarding cable tray weld inspection. A discussion of the cable tray weld inspection criteria will be included in a future FSAR Amendment.

Question 4:

Your report concludes that based on sampling methods used, up to 1.3% defective stiffener welds may exist for safety-related cable trays at Byron Units 1 and 2. Please provide us additional information regarding the basis for assuming that this is an acceptable level of risk. Also in your response, please address your plans for corrective action for any specific defective welds which are identified in the future, where such welds are a part of the population that was included in the study.

Response 4:

The field survey data revealed that 100% of the stiffeners surveyed had weld in excess of the minimum required by design. Based upon these results, one can calculate an associated reliability and confidence level for the sampling plan used. Our results yielded a 98.7% reliability at 95% confidence level. Implicit to this result is a 95% confidence that at most 1.3% defective stiffener welds may exist. Justification for acceptance of this statistical approach is primarily contained in the conservative criteria used to establish the governing minimum weld requirements. This criteria uses the worst case seismic load in the most critical location of the safety-related structure to establish the minimum weld requirements. Although all the field survey results were found acceptable according to this conservative criteria, violation of this criteria does not imply a failure condition because the stiffener in question might not be the governing case. In addition, the design of the stiffener weld ignores the membrane capacity of the cable tray, the flexibility of the cable tray and supports, the load-carrying capacity of the cables, the redundancy and separation of important cables, or the consequences of specific tray failures. Therefore, the risk here is a partial risk rather than a total risk.

The use of partial risk values on the order of 10% is not uncommon in engineering design. For example, the partial risk for the seismic design condition given in Regulatory Guide 1.60 is 16%. This partial risk value relates to the variability in response caused by the variability of ground acceleration time history corresponding to a prescribed design response spectrum.

The population of cable tray sections represented by the sampling plan cover all the cable tray sections shipped to date and is approximately 99% complete for Byron Station Units 1 and 2. Cable pan stiffener welds in future shipments will be inspected to ensure that design requirements are maintained. When defective welds are identified, the rejected cable tray section will be returned to the fabricator for repair.

Table 1

Revised January 12, 1981
December 18, 1980

Recommended Field Survey for
Commonwealth Edison Company
Nonconformance Report F-529

BUILDING/ELEVATION	SAMPLE SIZE FOR STRAIGHT* CABLE TRAY SECTIONS		
	12" width	18" width	24" width
<u>Auxiliary</u>			
330'	5	—	—
346'	2	3	2
364'	2	2	2
383'	2	3	2
401'	2	2	2
426'	2	2	2
439'	2	2	3
451'	2	2	2
463'-5"	2	—	2
<u>Containment</u>	5	3	2

*Non-standard lengths of straight sections may be substituted for a standard 10' section provided the welds for two stiffeners are field measured and reported.

BUILDING	SAMPLE SIZE FOR CABLE TRAY FITTINGS
Auxiliary	For each of the above elevations: 2 each of 3 different types
Containment	2 each of 3 different types