

**TELEDYNE  
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July 2, 1986

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*Designated original  
CMT Trammell*

Mr. David Jeng  
United States Nuclear Regulatory Commission  
Phillips Building  
Mail Stop 316  
7920 Norfolk Avenue  
Bethesda, MD, 20814

Subject: Audit of Impell Cable Tray Re-Analysis Effort

Dear Mr. Jeng,

Attached is Mr. E. A. Solla's memorandum to me relative to the subject audit. We understand that Mr. Bezler of BNL will write the audit trip report. The attached submittal is essentially for internal TES use but also serves as a "deliverable" under our contractual commitment to the NRC.

Very truly yours,

TELEDYNE ENGINEERING SERVICES

*Donald F. Landers*

Donald F. Landers  
President

DFL:mld  
attachment

cc: V. Noonan (NRC)  
C. Trammell (NRC)  
A. Vietti-Cook (NRC)  
G. Bagchi (NRC)  
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# MEMORANDUM

TO: D. F. Landers  
FROM: E. A. Solla *EAS*  
DATE: July 2, 1986  
SUBJECT: Audit of Impell for Comanche Peak

During the week of June 9, I participated in an NRC audit of Impell at their Walnut Creek offices on their cable tray effort for Comanche Peak.

On Monday, June 9, we received a status report and discussed responses to NRC questions from the previous audit in January. On Tuesday, June 10, we had a presentation on cable tray system analysis methods and special studies that are being done. On Wednesday, June 11, we had a presentation on their SUPERPIPE program and SUPERPOST program. It was decided that the best way to verify that the SUPERPIPE computer code is suitable for cable tray analysis and that the SUPERPOST computer code, which was written specifically for this project, addresses all concerns is to obtain several sample analyses and to reanalyze them using different computer codes. Five analyses were picked: two that EBASCO will do, one for Engineering Analysis Services, one for Brookhaven, and one for Teledyne.

On Thursday, June 12, an exit meeting was held. Six open items remained which required further action from Impell.

1. In PI-02, Rev. 3, Appendix A, an incorrect stiffness formula was given. Impell must go back to make sure that this formula was not used in any analyses.
2. Impell's method is unclear for the modeling of the eccentricities of nonstandard clamp. In some cases their method may yield unconservative results. Impell is to provide examples of nonstandard clamp eccentricity modeling.
3. Justification of certain aspects of clamp behavior is required.
  - A. Given the assumption of positive connection, from friction-type clamps, in the longitudinal direction on a transverse support, Impell must show that this is conservative for the loads at the longitudinal support.
  - B. Impell is to provide the rationale to model the friction connection at clips with a finite stiffness.

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July 2, 1986  
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- C. Tray clamps are modeled as a single connection at the center of the tray. This provides a more flexible connection due to the torsional stiffness of the tier, which will yield larger deflections and different mode shapes. Impell is to show that this is conservative.
4. In doing the code check for composite channels, the channels are separated and the bending and warping stresses distributed between the two members. Impell is to show that this method is conservative.
5. In the modeling of a reducer, a rigid link is used to provide the offset. This link transfers all loads from one section to another. Impell is to provide assurance that the real reducer will transfer these loads.
6. Impell is to show that when the longitudinal support is attached to the top flange that the shear load is shared equally by the two flanges.

The audit trip report will be written by Paul Bezler from Brookhaven National Laboratory and will be sent to us when it is complete.

EAS:jej