

ENCLOSURE 1

PRIORITIZATION EVALUATION

Generic Issue No. 91

"MAIN CRANKSHAFT FAILURES IN TRANSAMERICA
DELAVAL EMERGENCY DIESEL GENERATORS"

ISSUE 91: MAIN CRANKSHAFT FAILURES IN TRANSAMERICA DELAVAL EMERGENCY
DIESEL GENERATORS

DESCRIPTION

Historical Background

On August 12, 1983, one of the three emergency diesel generators (EDG) at the Shoreham Plant failed during overload testing as a result of a fractured crankshaft. Similar crankshaft cracks were discovered in EDG-103 and EDG-101 on August 22 and 23, 1983, respectively. In addition to the crankshaft cracks, four of twenty-four connecting rod bearings were found to contain cracks in the bearing shells. All three EDGs were supplied by Transamerica Delaval, Inc. (TDI) and were Model DSR-48 diesels.

On August 30, 1983, IE Information Notice No. 83-58 (Reference 1) was issued to inform licensees of the Shoreham event. Prior to this, IE Information Notice No. 83-51 (Reference 2) had been issued to inform licensees of various diesel generator problems. The staff reviewed the operating status of the three plants with TDI engines and sent letters to all TDI diesel owners requesting specific information about their respective engines. A letter was also sent to TDI on December 1, 1983 requesting information on the design development history of various parts of TDI machines. A response from TDI was sent on December 16, 1983 and, on December 23, 1983, the staff was informed that a TDI Diesel Generator Owners' Group had been formed to address the problem.

As a result of the EDG failure at Shoreham, a TDI Project Group was established (Reference 3) by NRR on January 16, 1984. On January 25, 1984, the staff provided the Commission with a status report in SECY-84-34 (Reference 4). In order to more clearly define the issue and to determine remedial action, the staff issued a letter to TDI on February 14, 1984 requesting more information (Reference 5). In March 1984, the TDI Diesel Generators Owners' Group submitted to the NRC its program for addressing the issue (Reference 6). In April 1984, the staff recommended to the Commission in SECY-84-155 (Reference 7) that the question of reliability of TDI diesels had generic implications and should be reported to Congress as an abnormal occurrence. An SER on the TDI Diesel Generator Owners Group Program Plan (OGPP) was issued by the staff on August 13, 1984 (Reference 8).

In its SER, the staff's overall finding was that the OGPP incorporates the essential elements needed to resolve the outstanding concerns relating to the reliability of the TDI diesel generators for nuclear service, and to ensure that the TDI diesel engines comply with GDC 1 and GDC 17. These corrective actions include: (1) resolution of known generic problems (Phase I), (2) systematic DR/QR of all components important to reliability and operability of the engines (Phase II), (3) appropriate engine inspections and testing as identified by the results of Phases I and II, and (4) appropriate maintenance and surveillance programs as indicated by the results of Phases I and II.

After licensees complete Phases I and II of the OGPP, the licensing basis will be reviewed by the staff to determine what modifications to the license conditions will be required. A final SER will be issued for each of the plants that are being licensed or restarted on an interim basis. These are expected to include: Shoreham, Grand Gulf, San Onofre, Catawba, and Comanche Peak. For plants where Phases I and II are scheduled to be completed sufficiently ahead of licensing or restart, a final TDI Diesel SER will be developed that encompasses the results of Phases I and II and the operational history of an engine.

Safety Significance

In the event of loss of offsite power, the power to operate the equipment necessary to maintain core cooling is provided in most plants by EDGs. Although to varying degrees, plants can withstand the loss of both offsite and onsite AC power (and further requirements are being proposed in USI A-44), EDG unreliability is a significant contributor to the estimated frequency of core damage events. The question of diesel generator reliability in general is addressed in Generic Issue B-56, "Diesel Reliability." This issue applies to the design and operation of the 16 plants which have or have not ordered TDI diesel-generators.

Possible Solutions

The possible solutions to this issue are considered to be the three elements of the TDI OGPP:

- (a) Phase I: Resolution of 16 identified generic problem areas intended (by the Owners' Group) to serve as a basis for the licensing of plants during the period prior to completion and implementation of the OGPP.
- (b) Phase II: A design review/quality revalidation (DR/QR) of a larger set of important engine components to assure that their design and manufacture (including specifications, quality control, quality assurance, operational surveillance, and maintenance) are adequate.
- (c) Identification of any needed additional engine testing or inspections based on findings from Phases I and II.

CONCLUSION

The solution to this issue has been identified in the staff's SER (Reference 8). The need for changes to the SRP, STS, or Regulatory Guides will be addressed at the conclusion of Phases I and II of the TDI OGPP.

REFERENCES

1. IE Information Notice No. 83-58, "Transamerica Delaval Diesel Generator Crankshaft Failure," U. S. Nuclear Regulatory Commission, August 30, 1983.
2. IE Information Notice No. 83-51, "Diesel Generator Events", U.S. Nuclear Regulatory Commission, August 5, 1983.
3. Memorandum for C. Berlinger from H. Denton, "Detail Assignment to DOL, Transamerica Delaval Emergency Diesel Generator Project Group (TDI Project Group)," January 25, 1984.
4. SECY-84-34, "Emergency Diesel Generators Manufactured by Transamerica Delaval, Inc.," January 25, 1984.
5. Letter to D. Bixby (TDI) from D. Eisenhut (NRC), February 14, 1984.
6. TDI Diesel Generators Owners' Group Program Plan, March 2, 1984.
7. SECY-84-155, "Section 208 Report to the Congress on Abnormal Occurrences for October - December 1983," April 11, 1984.
8. Letter to J. B. George (Transamerica Delaval, Inc. Owners' Group) from D. Eisenhut (NRC), "Safety Evaluation Report, Transamerica Delaval, Inc. Diesel Generator Owners' Group Program Plan," August 13, 1984.

GENERIC ISSUE MANAGEMENT CONTROL SYSTEM

The Generic Issues Management Control System (GIMCS) provides appropriate information necessary to manage safety related and environmental generic issues through technical resolution and completion. For the purpose of this management control system technically resolved is defined as the point where the staff's technical resolution has been issued. Generally, speaking, this occurs when the technical resolution has been incorporated into one or more of the following:

- (a) Commission policy statement/orders
- (b) NRC Regulations
- (c) Standard Review Plan
- (d) Regulatory Guide
- (e) Generic Letter

GIMCS is part of an integrated system of reports and procedures that would manage generic safety issues, TMI-related issues, and proposed new generic issues through the stages of prioritization, technical resolution, development of new criteria, review and approval, public comments, and incorporation into the Standard Review Plan (SRP), as appropriate. NUREG-0933 provides an evaluation for a recommended priority listing based on the potential safety significance and cost of implementation for each issue; NRR Office Letter Number 40 provided procedures and criteria for adding new generic issues to the system; and GIMCS provides proposed scheduling for resolving and completing issues on the prioritized listing. GIMCS will provide information to manage and control issues that are ranked High-priority generic issues, Medium-priority generic issues, issues for which possible resolution has been identified for evaluation, issues for which a technical resolution is available (as documented by memorandum, analysis, NUREG, etc.), and issues designated by the Director of NRR as issues for which resources have been made available for resolution and completion. Issues ranked as either "Low" or "Dropped" are not allocated resources. Therefore, there is no resolution to be tracked by GIMCS.

Some new generic issues prioritized and processed in accordance with NRR Office Letter No. 40 may not have resources allocated for resolution and completion. These issues will be listed in GIMCS as inactive issues. These will generally be Medium priority issues that have no safety deficiency demanding high-priority attention, but there is a potential for safety improvements or reduction in uncertainty of analysis that may be substantial and worthwhile. Efforts for resolution of these issues will be planned, over the next several years, but on a basis that will not interfere with the resolution of high-priority generic issue work or other high priority work. Thus, some (Medium) generic issues will be inactive until such time as resources become available to resolve the various issues. As resource allocations are directed at issue resolution, they will become active. The detailed schedule for resolving and completing the generic issue will be developed and monitored by the management control system.

Management and control indicators used in GIMCS are defined as follows:

1. Item No. - Generic Issue Number.
 2. Issue Type - Safety, Environmental or Regulatory Impact
High, Note 1 or Note 2 (From NUREG-0933),
Medium.
 3. Action Level - Degree of management attention needed to process
generic issues in accordance with established
schedules
 L1 - No management action is necessary
 L2 - Division Director action is necessary
 L3 - Director NRR action is necessary
 4. Office/Div/Br - 1st listed has lead responsibility for re-
solving issue, others listed have input to
resolution.
 5. Task Manager - Name of assigned individual responsible for
schedule updating.
 6. Tac Number - Each issue should be assigned a TAC #.
 7. Title - Generic Issue Title.
 8. Work Authorization - Who or what authorized work to be done on
generic issue.
 9. Contract Title - Provide Contract Title (if contract issued).
 10. Contractor Name/
 FIN No. - Identify Contractor Name and FIN Number (as
appropriate). If contract is not yet issued,
indicate whether the contract is included in
the FIN plan.
 11. Work Scope - Describes briefly the work necessary to tech-
nically resolve and complete the generic issue.
 12. Affected Documents - Identifies documents that the technical resolution
will be incorporated into to identify new criteria.
 13. Status - Describes current status of work.
 14. Problem/Resolution - Identifies potential problem areas and describes
what actions are necessary to resolve them.
 15. Technical Resolution - Identifies detailed schedule of milestone
dates that are required for completing the
issue through the issuance of the SRP revision
or other change that documents requirements.
- Milestones - Selected significant milestones. The "original"
schedule remains unchanged. Changes in schedule
are listed under "Current". Actual completion
are listed under "Actual".

TYPICAL MILESTONES

Other Division Involvement

Original

Current

Actual

- o Date information requested from Division
- o Date received from Division

Contractor Information

- o Proposal Solicited
- o Proposal Evaluated and Accepted
- o Contract Schedule, if applicable
- o Testing Schedule, if applicable
- o Draft NUREG/CR report from contractor/consultant

Staff review of draft NUREG/CR report

Value Impact Statement prepared (coordinated with SPEB and RRAB as applicable)

Final report prepared by Division (include SPEB preliminary comments and SRP revision)

----- 2 wks

Final report forwarded to DST for processing

----- 2 wks

CRGR Package to NRR Director for Review

----- 1 mo

OMB Clearance obtained concurrently if applicable

Review Package to CRGR

----- 1 mo

CRGR review and EDO approval
completed

----- 1 mo

Federal Register Notice of
Issuance of SRP for
Public Comment

----- 3 mo

Division review of public
comments completed

----- 2 wks

Comments incorporated and
transmitted to DST for
processing

----- 2 wks

Final CRGR package to
NRR Director for review

----- 1 mo

Review Package to CRGR

----- 1 mo

CRGR review and EDO approval
completed

----- 1 mo

Federal Register Notice of
Issuance of SRP

GENERIC ISSUE MANAGEMENT CONTROL SYSTEM

<u>Issue</u> <u>Number</u>	<u>Issue</u> <u>Type</u>	<u>Action</u> <u>Level</u>	<u>Office/Div/Br</u>	<u>Task</u> <u>Manager</u>	<u>Tac No</u>
		Active-L1	NRR/	TBP	TBP

Title -----

Work Authorization --- Memorandum to from H. R. Denton dated

Contract Title ----- To Be Provided.

Contractor Name/
FIN No. ----- To Be Provided.

Work Scope ----- To Be Provided.

Affected Documents --- To Be Provided.

Status ----- To Be Provided.

Problem/Resolution --- To Be Provided.

Technical Resolution - To Be Provided.

<u>Milestones</u>	<u>Original</u>	<u>Current</u>	<u>Actual</u>
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New Issues - Schedule To Be Developed

As of First Quarter FY-84

OFFICE							
SURNAME							
DATE							