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March 18, 1999

U.S. Department of Energy  
Richland Operations Office  
P.O. Box 550, MSIN H0-12  
Richland, WA 99352**RECEIVED****MAR 22 1999****DOE-RL / DIS**

Dear Mr. John P. Sands:

THIRD PARTY REVIEW OF THE ENGINEERING GUIDE FOR POST-EARTHQUAKE EVALUATION OF HANFORD FACILITIES, BECHTEL HANFORD INCORPORATED ENGINEERING GUIDE NUMBER 0000X-EG-C0002, REVISION 0, DATED MARCH 4, 1999.



In accordance with the requested job scope, BAT Associate, Mr Vern Severud, has reviewed the ENGINEERING GUIDE FOR POST-EARTHQUAKE EVALUATION OF HANFORD FACILITIES, Bechtel Hanford Incorporated (BHI) Engineering Guide Number 0000X-EG-C0002, Revision 0, dated March 4, 1999, and supporting documentation. The report of the review findings, and recommendations follows.

The review focused on the appropriateness of the methodology used in the guide, including the adequacy of the inspection, resulting from implementing the guide. The objective is to insure that normal entry is made when it can be reasonably concluded that personnel are not at risk from the structural effects of an earthquake.

The guide is intended to be used for evaluating the structural safety of the building systems and components, located on the Hanford site, and under the environmental restoration contractor, (BHI), custodianship. The guide draws heavily on the methodology of the Federal Emergency Management Agency (FEMA) 178 and the Applied Technology Council (ATC) inspection and evaluation procedures of ATC 20, 20-1, and 20-2. These ATC documents and two seismic structural analysis reports (Baxter, 1991 and Carrato, 1997) on the Reduction Oxidation (REDOX) building were also reviewed. The guide currently includes specific building guidelines for the REDOX building. Guidelines for the other buildings will be added in the future.

The ATC procedures, which are viewed as state-of-the-art for commercial and non-nuclear buildings, provide an excellent base on which to build the procedures and training for inspecting the structural post-earthquake safety of deactivated Hanford facilities.

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The guide and supporting documents were found to be technically sound, employing effective graded approaches, and appropriate methodology. Some specific changes to the guide, with appropriate rationale, are recommended and herewith attached.

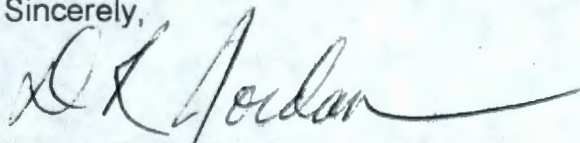
However, these are the type that help clarify the intent, or are editorial in nature, and can be incorporated into the guide when it is revised to incorporate other building specific guidelines.

Implementation of the guide will include appropriate training and qualification of the personnel who will do the inspections and evaluations. All inspection team members are to be experienced, trained, Hanford Site workers. The inspections and evaluations for structural safety, accomplished using the guide, are expected to be done safely and yield appropriate posting. This should ensure that normal entry can be made when it can be reasonably concluded that personnel are not at risk from structural effects of an earthquake.

In conducting this Third Party review, Mr. Severud contacted Mr Steve Parakh and Dr. R. S. Rajagopal of BHI. They were very professional and helpful.

Mr. Severud will be available to respond to any questions relative to this review and report.

Sincerely,



Dennis R. Jordan, Program Manager  
BAT Associates, Inc.

kjj

Attachment

cc: Mr. Dr. Nugent - BAT  
Mr. F. R. Serier  
Mr. L. K. Severud  
Document Control File

## Recommended Changes To BHI Engineering Guide POSTEARTHQUAKE EVALUATION OF HANFORD FACILITIES

P. 2 Suggest starting paragraph 2.0 Design Criteria with the word "Many" existing SSCs at the Hanford Site have typically been designed using the seismic provisions of the Uniform Building Code... Rationale: A number of the Hanford facilities had more demanding seismic design codes than the UBC. Suggested change is editorial.

P. 4 Suggest adding to Section 3.3 Detailed Evaluations, first paragraph, third line, after qualified personnel "(per Sections 6.0, 6.2, 6.3) " are used.... Rationale: help make reader more quickly aware of the training and qualification requirements for qualified personnel. Suggested change is editorial.

P. 5 Suggest adding to Section 3.3 Detailed Evaluations, fifth paragraph the additional sentence: "Special attention to overhead cranes, bridges, platforms, and equipment and their anchorage and support that could be weakened or failed and pose potential falling object threats to personnel." Rationale: Add emphasis on these common personnel safety concerns.

P. 5 Suggest adding to Section 3.5 Equipment Inspections, after the first sentence of the first paragraph: " Also, attention as appropriate should be given to equipment needed for ventilation and emergency power systems that are needed to perform safety functions." Rationale: Add emphasis on equipment that are often part of systems that are important to continued safety of nuclear facilities with limited radioactive inventory (e.g., equipment needed for confinement, instrumentation and controls, etc.).

P. 7 Suggest changing Section 6.2 Detailed Evaluation Team Qualifications, first sentence to read: "At least one of the team members should have at least 5 or more years of experience in structural design..." Rationale: current sentence ...a minimum of 5 to 10 years... appears overly restrictive.

P. 7 Suggest adding to Section 6.3 Pre-evaluation Training, fourth line to read: ...in Sections 3, 4 and 5 to assure... Rationale: Training is intended to also cover applicable engineering procedures in Sections 3 and 4, not just 5 as currently stated in the Guide.

P. 17 Suggest adding to Attachment 3 checklist for equipment evaluations the following general items: Overhead cranes, bridges, platforms, anchorages and supports of equipment, valves and their operators, cable raceways, HVAC and ventilation system equipment, HEPA filters, and Radiation instruments. Rationale: Help identify to the inspection team those items typical of Hanford nuclear processing buildings and not usually typical of commercial buildings.

P. 31 Suggest that the Appendix B Building 202-S (REDOX) summary of potential areas of concern also indicate that the main ventilation system should also be inspected for seismic structural damage and service as needed to assure it will perform its safety function prior to and during the inspection team survey and for later entrance of people to REDOX.