



Department of Energy
National Nuclear Security Administration
Washington, DC 20585

June 15, 2005

OFFICE OF THE ADMINISTRATOR

The Honorable A.J. Eggenberger
Acting Chairman
Defense Nuclear Facilities Safety Board
625 Indiana Avenue, N.W., Suite 700
Washington, DC 20004-2901

Dear Dr. Eggenberger:

On March 18, 2005, the Defense Nuclear Facilities Safety Board (Board) sent a letter to the National Nuclear Security Administration (NNSA) requesting results of a condition assessment and mapping of building leaks and structural cracks at the Device Assembly Facility at the Nevada Test Site. The mapping of building leaks was sent to the Board on May 16, 2005. This letter transmits mapping of the structural cracks. Enclosure 1 to this letter contains a summary of crack locations within each building of the Device Assembly Facility, general orientation, and the largest crack size in each room. Enclosure 2 contains more details of crack locations and floor plans for each building, and cracks that have been monitored over the last several years.

As noted in our previous letter, steps have been taken to start the comprehensive review of the structural capacity of the Device Assembly Facility. To accomplish this goal, we will evaluate the integrity of Device Assembly Facility structures using a phased approach that is outlined below.

Phase I. In this phase, safety related structural elements (walls and slabs, as determined in the Documented Safety Analysis) that contain cracks 0.04 inch or wider will be evaluated using simplified analytical methods. The overall purpose of this evaluation will be to estimate the available design margin considering the cracks, and to determine if a more detailed evaluation is necessary. The evaluation will consider the location and orientation of the cracks, supporting condition of the structural element, reinforcement quantity and pattern, and any cause(s) of the cracking that impacts these factors, if deemed necessary.

The selection of structural elements with cracks 0.04 inch or wider is based on the acceptance criteria defined in Section 5.2 of the American Concrete Institute 349.3R-02, "*Evaluation of Existing Nuclear Safety-Related Concrete Structures*" and on our crack monitoring program that has monitored 42 cracks for approximately seven years. The crack monitoring program results indicate that these cracks are stable. As we execute Phase I of our evaluation we will discuss the final selection of structural elements with your staff.



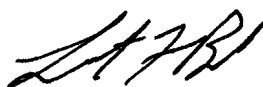
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Phase II. In this phase we will utilize more refined methodologies to evaluate the structural capacity of structural elements that could not be qualified by the simplified methods used in Phase I. This phase could also include more detailed structural evaluations of other structural elements as deemed necessary. The overall purpose of this phase is to identify those cracked structural elements that may be associated with less than adequate structural capacity to determine if any structural upgrades are necessary.

Phase III. This phase will execute the Seismic Analysis and Evaluation Plan that was mentioned in our May 16, 2005, letter. As noted previously, this plan is expected to be finalized in the near future. NNSA will keep the Board and its staff apprised of the progress on resolving this issue.

If you have any questions, please contact me or have your staff call Ms. Laura Tomlinson at the Nevada Site Office, telephone number 702-295-2588.

Sincerely,



Linton F. Brooks
Administrator

Enclosures

cc:

K. Carlson, NSO, w/o attachment

M. Whitaker, DR-1, w/attachment

Enclosure 1 (Summary of Cracks Location) to DNFSB Letter Transmitting DAF Cracks Mapping
 Cracks location, width, and length shown in this Enclosure and in Enclosure 2 are approximate
 FF: Finished Floor; AFF: Above Finished Floor

1. More detailed description is provided in the Enclosure 2 of the NNSA Letter

Building No.	Floor	Room No.	Total No. of Cracks	Maximum Crack Width (in)	Majority Crack Width (in)	Maximum Crack Length (ft)	General ¹ Orientation	Extent ¹
711	1	100	3	.020	.015	15	Vertical	FF to crane corbel
351	1	101	6	.020	.015	21	Vertical	FF to 19' AFF
		104	None					
353	1	101	8	.020	.015	13	Vertical	8' AFF to 19' AFF
		102	None					
491	1	101	15	.040	.030	28	Vertical	FF to 28' AFF
493	1	101	8	.025	.020	8		FF to 8' AFF
495	1	101	2	.020		9	Vertical	10' AFF to crane corbel
341	1	101	2	.015	.015	6	Vertical	5' AFF to 11' AFF
		102	2	.020	.020	13	Vertical	5' AFF to 18' AFF
		103	4	.020		6	Vertical	Crane corbel to wall tile

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Building No.	Floor	Room No.	Total No. of Cracks	Maximum Crack Width (in)	Majority Crack Width (in)	Maximum Crack Length (ft)	General Orientation	Extent
343	1	101	2	.020	.015	13	Vertical	FF to 13' AFF
		102	None					
		103	1	.025	.025	5	10 deg off vertical	10' AFF to 15' AFF
345	1	101	2	.025	.020	12	Vertical	FF to 12' AFF
		102	2	.020		11	Vertical	FF to 11' AFF
		103	5	.020	.015	10	Vertical	FF to 12' AFF
331	1	101	5	.020	.020	10	45 deg to west wall	Diagonal
		102	None					
		103	4	.015	.015	12	Vertical	FF to ceiling
		104	6	.015	.015	20	Vertical	FF to ceiling
		105	1	<.015		5	5 deg from vertical	FF to 5' AFF
		106	1	<.015		9	Vertical	FF to ceiling

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Building No.	Floor	Room No.	Total No. of Cracks	Maximum Crack Width (in)	Majority Crack Width (in)	Maximum Crack Length (ft)	General Orientation	Extent
		110	3	.025		9	Vertical	FF to ceiling
313	1	313B	12	.030	.015	9	Vertical	FF to ceiling
801	1	None						
315	1	101	1	.015		5	45 Deg from Vertical	Diagonal
317	1	101	1	.015		6	5 deg. from vertical	FF to 6' AFF
305	1	101	1	.020		3	Horizontal	South wall to expansion joint
		102	11	.025	.015	14	Vertical	FF to ceiling
		103	None					
		104	2	.025		12	Vertical to 5 Deg from Vertical	FF to ceiling
		105	2	.020		11	Vertical	FF to ceiling
		106	4	.020	.015	10	Vertical	FF to 10' AFF
		107	1	.015		9	Perpendicular to N/S wall	
		108	4	.015	.015	10	Vertical	FF to 10' AFF

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305	1	109	3	.015	.015	10	Vertical	FF to 10' AFF
		110	1	.015		6	Vertical	FF to 6' AFF
303	1	101	None					
		102	2	.015		13	10 deg. from vertical	FF to 5' AFF; then 5 deg. from vertical to ceiling
		103	None					
		104	2	.015		12	Vertical	FF to ceiling
		105	4	.030	.015	12	Vertical or perpendicular to west wall	FF to halfway to ceiling on walls; east-west between walls on ceiling
		106	4	.020	.015	7	Vertical	FF to ceiling
		107	7	.030	.015	12	Vertical	FF to ceiling
		108	3	.025	.015	13	Vertical	FF to ceiling
		109	2	.020		12	Vertical	FF to ceiling
		110	None					

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301	1	101	3	.025	.015	10	45 deg from west wall to east wall	
		102	13	.05	.015	15	Up to 15 deg from vertical on walls; perpendicular to west wall on ceiling	FF to ceiling
		103	1	.015		14	Vertical	FF to ceiling
		104	5	.015	.015	12	Vertical	FF to ceiling
		105	13	.030	.015	13	Up to 30 deg from vertical on walls; perpendicular to west wall on ceiling	FF to ceiling
		106	3	.015	.015	12	Vertical	FF to ceiling
		107	6	.015	.015	12	Vertical	FF to ceiling
		108	7	.025	.020	13	Vertical to up to 15 deg from vertical	FF to ceiling
		109	2	.015		12	Vertical	FF to ceiling

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		110	8	.015	.015	12	Vertical	FF to ceiling
304	1	101	None					
		102	6	.025	.015	15	Perpendicular to west wall	Runs east-west between walls
		103	None					
		104	None					
		105	None					
		106	1	<.015		12	Vertical	FF to ceiling
		107	4	.020	.015	15	Vertical	FF to ceiling
		108	4	.025	.02	12	Vertical	FF to ceiling
		109	2	.015		10	Vertical	FF to 10' AFF
		110	None					
302	1	101	1	.020		10	Near east wall toward center of ceiling	Diagonal
		102	9	.030	.015	12	Vertical	FF to ceiling
		103	1	.015		10	Vertical	FF to ceiling
		104	4	.015	.015	9	Vertical to 5 deg from vertical	FF to ceiling

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		105	4	.015	.015	10	Vertical	FF to ceiling
		106	2	.015	.015	9	Vertical	FF to ceiling
		107	8	.03	.025	13	Vertical	FF to ceiling
		108	3	.025	.02	12	Vertical	FF to ceiling
		109	2	.020		9	Vertical	FF to ceiling
		110	3	.015		5	Vertical	FF to 5' AFF
802	1		3	.015		9	Vertical	FF to ceiling
332	1	101	2	.020		35	Perpendicular to south wall	Runs N/S between walls in ceiling
		102	1	.015		9	Vertical	FF to 9' AFF
		103	None					
		104	4	.015	.015	10	Vertical	FF to 10' AFF
		105	1	.015		7	Vertical	FF to 5' AFF

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Building No.	Floor	Room No.	Total No. of Cracks	Maximum Crack Width (in)	Majority Crack Width (in)	Maximum Crack Length (ft)	General Orientation	Extent
		106	4	.030	.020	14	Vertical	FF to ceiling
352	1	101	1	.015		11	Vertical	10' AFF to tiled area
		102	None					
354	1	101	1	.015		9	Vertical	FF to 9' AFF
		102	None					
492	1	101	10	.045	.030	10	Vertical	FF to 9' AFF
494	1	101	11	.040	.020	9	Vertical	FF to 9' AFF
712	1	100	3	.015	.015	14	Vertical	FF to crane corbel
310	1	103	None					
		105	2	.020		8	Vertical	FF to ceiling
		106	None					
		108	4	.015	.015	8	Perpendicular to north wall	FF to ceiling
		117	6	.040	.040	20	Vertical to up to 30 deg from vertical	FF to 12' AFF

Building No.	Floor	Room No.	Total No. of Cracks	Maximum Crack Width (in)	Majority Crack Width (in)	Maximum Crack Length (ft)	General Orientation	Extent
		107	15	.035	.020	17	Mostly Vertical	Mostly FF to ceiling (see Crack Mapping Data Table)
		108	8	.025	.025	25	Vertical to up to 15 deg from vertical; some w/horizontal branches	Mostly halfway to ceiling (see Crack Mapping Data Table)
		109	10	.060	.020	19	Vertical to up to 30 deg from vertical	Mostly FF to ceiling (see Crack Mapping Data Table)
		110	8	.035		18	Mostly vertical; one horizontal	Mostly FF to ceiling (see Crack Mapping Data Table)
		111	19	.050	.015	18	Mostly vertical	Mostly FF to ceiling (see Crack Mapping Data Table)
		112	4	.040		18	Vertical to up to 30 deg from vertical	FF to ceiling
		113	2	.030		18	Vertical	FF to ceiling
		114	16	.040	.015	13	Mostly Vertical	Mostly FF to ceiling (see Crack Mapping Data Table)
400	2	137	2	.030		12	Vertical	FF to ceiling

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		201	5	.025	.020	9	Vertical to up to 10 deg from vertical	FF to ceiling
		202	5	.035	.030	12	Vertical to up to 15 deg from vertical	FF to 9' AFF
		203	2	.030		13	Vertical to up to 1 deg from vertical	FF to ceiling
		204	2	.020		12	Vertical	FF to ceiling
341	2	201	4	.025	.025	10	Mostly vertical	FF up to 9' AFF (see Crack Mapping Data Table)
343	2	201	6	.030	.025	10	Vertical to 20 deg from vertical	Two FF to ceiling; three FF to 8' AFF
345	2	201	3	.035		8	Vertical	FF up to 8' AFF
611	2	201	1	.020		8	20 deg from vertical	FF to 7' AFF

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		202	2	.02		9	Vertical	FF to ceiling
		204	4	.025	.025	9	Vertical	FF to ceiling
		208	2	.030		8	Vertical	One FF to ceiling; one FF to 7' AFF
610	2	201	3	.025	.015	9	Vertical	All FF to ceiling
		203	2	.025		9	Vertical	All FF to ceiling
		206	2	.025		2	Vertical	Header to ceiling
		207	17	.050	.040	14	Mostly vertical	Half FF to 8' AFF; half FF to 12' AFF
		208	13	.04	.040	10	Mostly Vertical	FF up to 9' AFF (see Crack Mapping Data Table)
370	2	201	10	.035	.015	12	Mostly Vertical	FF up to 8' AFF (see Crack Mapping Data Table)
		202	14	.060	.030	14	Mostly vertical	FF to ceiling
		203	8	.035	.030	13	Up to 45 deg from vertical	Mostly FF to ceiling (see Crack Mapping Data Table)

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Building No.	Floor	Room No.	Total No. of Cracks	Maximum Crack Width (in)	Majority Crack Width (in)	Maximum Crack Length (ft)	General Orientation	Extent
		204	22	.060		13	Vertical or up to 10 deg from vertical	Mostly FF to ceiling (see Crack Mapping Data Table)
		205	14	.070	.050	13	Vertical or up to 20 deg from vertical	Mostly FF to 8' AFF (see Crack Mapping Data Table)
		206	12	.050	.025	12	vertical or up to 40 deg from vertical	Half FF to ceiling; others FF up to 10' AFF (see Crack Mapping Data Table)
		207	15	.070	.045	12	Mostly vertical	Mostly FF to ceiling
		208	10	.060	.045	13	5 to 20 deg from vertical	Several FF to ceiling; others FF up to 9' AFF (see Crack Mapping Data Table)
		209	10	.050	.050	12	5 deg from vertical	FF to ceiling
		210	5	.035	.030	12	Vertical	FF to ceiling
		211	6	.040	.015	12	Vertical	FF to ceiling

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Building No.	Floor	Room No.	Total No. of Cracks	Maximum Crack Width (in)	Majority Crack Width (in)	Maximum Crack Length (ft)	General Orientation	Extent
		212	10	.090	.015	12	Vertical	FF to ceiling
		213	1	.025		5	Vertical	FF to 5 ft AFF

Enclosure 2 (Detailed Crack Locations and Floor Plans)

Contains Unclassified Controlled Nuclear Information, therefore, is separated from the main body of the NNSA Letter to the Board