Comments on the CNWRA report, Assessment of Structural Robustness against Aircraft Impact at the Potential Repository at Yucca Mountain - Progress Report, P. A. Cox, J. Mathis, A. Ghosh, August 2005.

The report is very well written and the work done is excellent. However, the staff has the following comments:

1.   Page 2-3: Revise Figure 2-1 to include all dimensions, including the height, thickness of the stiffened walls, boundary conditions, etc.

2.   Page 2-2, section 2.2.1:

   a.   Compare the blast pressures on the wall surface obtained from the tests and the analysis, and discuss how the pressures compare with the Blast-X calculations referenced on page 2-3.
   b.   Compare the maximum displacement time-history or other physical parameter obtained from the test and the analysis.

3.   Page 2-4, Figure 2-2: Investigate the reason for the velocity differences in the test and analysis during the initial period (e.g. are we applying less load or that mesh is not refined enough). Since there is a reference to "erosion algorithm" in the bottom paragraph of 2-3, it appears that some of the concrete element had failed. It would be good to include a figure showing the final deformation of the wall.

4.   Page 2-4, section 2.2.2: Describe the engine dimensions and the model, including the method of modeling, elements, properties etc., instead of referring them to the Muto's paper.

5.   Page 2-7, table 2-2: Include US Units in addition to the SI Units. Review the full report to verify that units are shown in both systems.

6.   Page 2-9, Figure 2-6: Revise the title to include the velocity of 215 m/s (705 ft/s).

7.   Page 2-11, line 1: The scale of the test needs to be clearly stated.

8.   Page 2-11, section 2.2.2.3: Describe the engine models (test and the analysis) in details, including the physical dimensions, element types, material properties etc.

9.   Page 2-12, Figure 2-12: The results from the analysis do not compare well to the test results. Please review the LS-DYNA simulation in details to correct the problem. This may include use of a different concrete model, finer mesh etc. Also, please explain the reason why the analytical model is not able to predict the bounce-back observed in the test.

10.   General: For all LS-DYNA analyses, please review the kinetic, internal energy, hourglass energy, etc. to verify that they are reasonable.

11.   Page 3-1, paragraph 1, last sentence: Change "compressive" to "tensile and compressive".

12. Page 3-1, 3rd paragraph: Specify the model of the F-16 aircraft. I believe the aircraft you have used is F-16C, and change "37 ft/s" to "371 ft/s".

13. Page 3-3, Figure 3-4: Show location of the Node 200901 in the model.

14. General: Include the Material and Element Types used in the LS-DYNA analyses.