Initial failure information and actions (email) - M. Amato July 6

All
Summary of ACD PMT meeting today. Next meeting is tomorrow (wednesday) at 4 pm in bdlg 5 room C231. Please come with any early results. Below are actions followed by a draft summary of what we know

ACTIONS

- Get rating of failed PMTs - done
- Get and test RTV samples from first batch used for earlier tests and new batch used for latest PMTs, test for property variances. *Paul H, Mike V, C He, Steve S.?*
- X-ray failed PMTs (look for crack info and any detectable bubbles in RTV?), *Charles H, ?*
- Remove 4 failed PMTs from housings, inspect for failure origin. *Charles H, D*
- Review analysis again. *Jim L, Kevin D, Ryan S, Len W*
- Revive attempt to derive and execute series of strain tests to correlate FEM model to actual measured strains. (Walt pointed this out as one item that caused uncertainly in reliability predictions since strength testing for outside score failures was not possible) *Mike V, Jim L, Kevin D, Ryan S, Len W, Walt T*
- Test RTV sample for shrinkage during curing (this could result in causing room temperature stress on PMTs) *Steve S*
- Test PMTs for qual/spare chassis to one cycle, stop on the way down from Hot to check tubes. After test use unfailed tubes to populate qual/spare chassis. *Chuck P, Glenn U*
- Resume PMT partial life testing after removing one tube for partial Mu metal removal and strain gage testing. Follow original thermal cycling plan. *Chuck P, Glenn U, Pilar J*

What we know (draft) ;

Original new PMT design tests this spring had no failures out of 9 tested, They included

- Thermal cycle of 5 and vib of 4 of the 5 to beyond qual levels

  -40 to +45C, 4 cycles, caps on loose -50 to +45 C, 2 cycles, caps on loose

  -60 to +45 C, 2 cycles, caps on loose

- Thermal Vac of 4 CAl PMT units

  -40 to +45C, 6 cycles (3+3?), caps on fibers, Res/Net installed

Tests of new design late last week had 4 out of 16 crack, they included

- Thermal cycle partial life test of 11 "WORST' rated NG tubes

  -30 to +45C, 12 cycles, failed 2, cap on loose, test will be resumed for 100 more cycles, removed one for strain gauge testing

- Thermal cycle of first 5 flight tubes for first single rail flight chassis

  -30 to +40C, 1 cycle, failed 2 'FAIR' PMTs, 2 worst PMTs did not fail,, cap on loose. AA0022 and AA0379 failed

All tests had delta T rates ranging from 20 to 30 deg pre hour.

Differences between early and later tests - New RTV batch, New technicians doing the potting.

Other Variables that always exist - PMT diameter, bubbles in RTV

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