Swanson, Greg

From: Throckmorton, David
Sent: Friday, November 16, 2001 2:40 PM
To: Munafo, Paul
Cc: Kilpatrick, Bill; Swanson, Gregory
Subject: RE: Fracture Analysis "Help"

Mun --

Can you explain for me: what is the "wheel problem" ? As this is described as a fracture analysis issue, should there be involvement/participation by the Fracture Control Board?

Dave

From: Munafo, Paul
Sent: Friday, November 16, 2001 1:25 PM
To: 'HORIUCHI, GAIL K. (JSC-EM) (NASA)'; 'ralph.r.roe@jsc.nasa.gov'
Cc: Stephenson, Art; Kilpatrick, Bill; Throckmorton, David; McGill, Preston; Wells, Doug
Subject: RE: Fracture Analysis "Help"

Gail,
Preston McGill, Doug Wells and I have reviewed the package sent by Glen Ecord, and the bottom line is that we agree with the approach that you are taking. It's clearly necessary to run a test, since the bounding assumptions required for an analytical approach are necessarily so conservative that you quickly get driven to a negative result. You are using an Electro-Discharge-Machined (EDM) notch to simulate the corrosion pit, which is normal for this kind of a test because you can't replicate the corrosion pit accurately in the lab. Whether the (sharp) notch is a more severe condition than the corrosion pit, or vice versa, is arguable - I feel that it is, and Preston thinks it might not be - but that question will resolve itself as you monitor the condition of the notch between simulated landing cycles. The best result for the Program would be if you quickly develop a crack out of the notch - a condition that is certainly worse than the pit - and it subsequently survives a lot of landing cycles. The biggest threat seems to be that the test proves to be too conservative - it cracks quickly, then fails early in the test series - but we'll have to deal with that later if it happens. The most likely result will be somewhere inside of those two, such as a lot of cycles with not much happening.

In the longer term, we would like to work with you to develop an analog test that closely duplicates the strain field in the wheel - along the lines of what we did on the Space Station Node gussets - so that we'll have an experimental basis for reinforcing the results of this test, and for evaluating future problems of this kind. We'll get with Glen soon to begin this task.

Again, we agree with your approach, and we look forward to hearing about the results. If you need to contact me at any time over the weekend, please call me on my cell phone: 256-651-9927.

Paul M.

-----Original Message-----
From: HORIUCHI, GAIL K. (JSC-EM) (NASA)
[mailto:gail.k.horiuchi1@jsc.nasa.gov]
Sent: Friday, November 16, 2001 10:31 AM
To: 'Munafo, Paul'
Subject: FW: Fracture Analysis "Help"

> -----Original Message-----
> From: SHACK, PAUL E. (JSC-EA42) (NASA)
> Sent: Friday, November 16, 2001 9:10 AM
> To: HORIUCHI, GAIL K. (JSC-EM) (NASA); ECORD, GLENN M. (JSC-ES4) (NASA);
> JACOBS, JEREMY B. (JSC-ES4) (NASA); ORTIZ-LONGO, CARLOS R., PHD (JSC-ES)

> (NASA); BECKMAN, KEITH A. (JSC-ES) (NASA)
> Cc: SERIALE-GRUSH, JOYCE M. (JSC-EA) (NASA); MILLER, GLENN J. (JSC-ES)
> (NASA); KRAMER, JULIE A. (JSC-ES) (NASA)
> Subject: Fracture Analysis "Help"
>
> At yesterday's FRR, some questions came up from Code Q - Mike Greenfield -
> regarding pass/fail criteria and the applicability of fracture analysis to
> the wheel problem. There is a formal action to present the rationale and
> criteria at the L-2 review on November 27.
>
> The MSFC center director has also volunteered some help and gave Dittemore
> the name of Paul Monafo as their expert. Ralph would like our analysis
> people to contact MSFC and aprise them of the path we are on and our
> rationale for test and analysis. Getting their understanding and buy-in
> would help head off a possible confrontation on the 27th.
>
> In short - somebody please tagup with Monafo.