From: Grant Minor
To: "Lia Merminga"; "Pierre Bricault";
cc: "Keith C Ng"; "Ron Kuramoto"; "Isaac Earle"; "Yuri Bylinsky"; "cessford@triumf.ca"; "Donald Jackson"; "Doug Preddy";
Subject: M9T2 Joint Repair - Status Update 16 Oct 2012
Date: October 16, 2012 7:42:00 PM

Hi Lia, Pierre, et. al.

Yesterday and today:

- Keith C. Ng and Isaac Earle worked hard to use the 8" diameter thin-profile scraping tool to clean the T2 and Q1 flanges of the M9 channel
    - This job took longer than expected due to difficulty obtaining correct flange loading for scraping. It was completed around 4pm today (Tuesday)
    - Video inspection performed today and reviewed by Isaac, Keith, and Ron Kuramoto indicated that the cleanliness of the flanges is now *no worse* than it was for the previous two ring installations (TB22134 installed Oct 2011, TB22148 installed June 2012)
    - We believe the flanges are adequately clean, and any additional attempts to continue scraping will result in further dose accumulated for negligible improvement
- Ron Kuramoto finished rolling indium into the blank-off ring TB22228 #1 yesterday the ring has been cleaned and inspected and is ready for installation
- Grant Minor inspected the impression in the failed ring TB22148 and took detailed notes (see RH e-log)
- Four aluminum bronze spring-eye pins with diameters .499", .514", and 2x .529", described by drawings TB22229 and TB22230, have been machined, cleaned, engraved, and are ready to use
- While Keith and Isaac finished the flange cleaning and scraping today, Grant and Ron Kuramoto finished rolling the indium into one-half of the spare blank ring TB22228 #2
    - This ring would be needed if TB22228 #1 were removed after an initial 48 hour set for inspection
- Around 4:30 pm today Ron, Grant, Keith, and Isaac reviewed their notes from the last two indium impressions (TB22134 Oct 2011, TB22148 June 2012) and discussed the technical path moving forward

My recommendations moving forward tomorrow:

- Tomorrow morning we will install the blank ring TB22228 #1 with the .499" diameter pin on the West and the .514" diameter pin on the East
    - TB22228 is .030" thicker than the last blank-off TB22134 (Oct 2011), but the two pins described above are each .045" thinner compared to the set used for TB22134
- The decision to go with a thicker blank ring but .045" - .030" = .015" proportionally thinner pins was made in order to:
    - Provide .030" more margin on the lower welded bellows support lug and tie rod assembly (from ring thickness) compared to TB22134 (Oct 2011)
    - Reduce the overall spring-eye compression loading for TB22228 at Beginning of Life (BOL) relative to TB22134 (Oct 2011) (from pin diameters)
        - § Inspection notes from TB22134 after removal in Spring 2012 revealed that this blank-off was quite heavily loaded (but did not fail)
        - § Inspection of the lower welded bellows support lug and tie rod assembly in Spring 2012 before removal of blank-off TB22134 revealed the bottom bolt to be in tension. Reducing loading by reducing pin diameter can help prolong creep and the onset of this problem.
- After we install the blank-off TB22228 and pins tomorrow, we will start vacuum
- Once the vacuum is low enough, a vacuum leak check should be performed. This can occur any time between Wednesday afternoon and Friday morning
- By Friday morning, the ring will have set for approximately 48 hours under spring-eye and vacuum load
    - Overhead visual inspection of the flange with binoculars of the alignment of the ring and the spring-eye gap will tell us if we need to vent and remove the blank-off to inspect
- Should we NOT notice any problems by overhead visual inspection or vacuum leak check, we should begin tearing down the RH tool setup Friday in preparation for block moves to cover-up on Monday and Tuesday next week (Oct 22nd and 23rd)
    - After reviewing notes, we determined that the effect of the intended changes we have made to the ring and pin set will not be detectible by our normal inspection methods in the indium impression should we vent and remove TB22228

- We only need to remove TB22228 and inspect if there is a leak or if we observe something very wrong from overhead binoculars inspection after the joint set period on Friday morning
- Removing TB22228 after the set period to inspect is of questionable value unless there is an obvious problem, and would incur approximately a 3-day additional delay and we would likely miss our target beam-on date of Oct 24th

- After the 48-hour set period, if we see that the spring-eye gap has closed completely and the loading is compromised, we will remove the pins and insert the thicker set we have prepared, .514" for the West and .529" on the East.
    - Vacuum leak check will have to be repeated after this, but the 48-hour set period will not be required
    - We should still be done then by Friday to prepare for tear-down and block moves as scheduled

Thanks and best regards,

Grant

Grant Minor, M.A.Sc., P.Eng.
TRIUMF Remote Handling Group Leader
Nuclear Engineer
4004 Wesbrook Mall, Vancouver
BC, Canada, V6T2A3
gminor@triumf.ca
(604) 222-7359
http://www.triumf.ca/profiles/4557