Sienel, Beth

From: Anvari, Jay
Sent: Tuesday, March 16, 2004 10:35 AM
To: Sienel, Beth
Subject: Top Ten Action Plan

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(50 KB)

A-184

SCH-1 Reliability

Top Ten Equipment Reliability List Action Plan

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Maintenance Support Department
2/3/2004, rev. (3)

Problem Statement:

Unresolved Emergent and Longstanding Reliability Issues Associated with SCH-l, SACC-IA and SACC-I B

Discussion:

The problems have been broken down into five items for clarity. Item five; Identified Design Issues is described in detail in attachment A).

1. The SCH-I evaporator has developed a refrigerant leak and requires repair or replacement. This is an emergent issue that was first identified on 1114/2003.

2. The original low ambient control damper and gas operated cylinder for SACC-IA was replaced under work order 96-011816 and MM 2002-047 in May of 2003. The system performed adequately during the summer but starting in August intermittent trips on high pressure occurred. Similar problems occurred in late summer and fall for SACC-IB, but were remedied when the Motor Master controller was replaced in September.

3. The reliability of SACC-IA/B has degraded significantly in the last two years. This is evident in the failure history for the fan motors, head pressure controls and fan thermostats.

4. Low pressure trips of SCH-I-I and SCH-I-2 due to refrigerant migration are anticipated to continue to result in a minor operator work around this winter. A recently installed upgrade to the control system will mitigate this problem and allow operators to reset the trips per instructions in OP 2192; however the root cause for the problem has not been addressed.

5. A number of longstanding design issues have a direct impact on the reliability of the Control Room HV AC sub-system. See attachment A) for details.

Objectives:

For clarity objectives are listed under each item number described above.

Item 1, SCH-l Evaporator Leak:

- Implement work order 03-005514-00 to replace the evaporator. **Complete; 1/24/2004**
- Post repair, disassemble and inspect the failed component to determine cause and evaluate need for further action. Work Request 04-____ initiated.

Item 2, SACC-IA Head Pressure Control Problems:

- Resolve Head pressure control problems that result in system trips.

Item 3, SACC-1 A/B Reliability:

- Evaluate apparent degradation in equipment reliability and determine causes.
- Based on evaluation identify corrective actions to improve component reliability.

Item 4, SCH-I Refrigerant Migration:

- Evaluate the severity of the problem after the control upgrades installed in 2003 and determine if further action is warranted.

Item 5, Unresolved Design Issues:

- Initiate Engineering Request to correct any design deficiencies that adversely impact system reliability and performance.

Project Team:

Management Sponsor: Chris Wamser
Team leader: Leonard Murphy, Maintenance Support Department Team Member: Jay Anvari, System Engineering
Team Member: Bernie Jwaszewski, FSDE
Team Member: Marty Flynn, EI&CDE

Status Report as of 2/3/2004:

Item I, SCH-I Evaporator:

Completed Actions:

- The source of the leak was verified to be the evaporator for SCH-I-2 under troubleshooting work order 03-005307-000.

Future Actions:

- Work order 03-005514-000 is on hold for a brazing procedure to permit the use of cadmium free filler metal. The work is currently scheduled for the week of 1/19/2004. A replacement evaporator is in stock and the part has been verified for suitability for use. The manufacturer has recommended replacement of the entire chiller skid, but this option is not under consideration at this time. Planning, EFIN, and Maintenance Support are actively working on resolving the issues associated with this work order. **Work Complete; 1/24/2004**

Item 2, SACC-IA Head Pressure Control Problems:

Completed Actions:

- Work order 03-004122-000, 8/11/2003; Motor Master sensor clamp tightened.
- Work order 03-004286-000, 8/26/2003; coil cleaned.
- Work order 03-004351-000, 9/10/2003; Motor Master sensor was relocated.

- Maintenance Support investigated supply voltage to both condensers. ERFIS printout for points EO 15 (Bus 8) and EOl8 (Bus 9) found at 475 and 463 volts respectively with less than 10% deviation over 60 hour period. As found voltages within industry standard of 10% of nameplate rating.

- Work order 03-004570-000, 9/22/2003; Motor Master was replaced.

- Carrier representative was brought in to evaluate problem. No immediate corrective actions were recommended. Carrier Corporation has indicated it will research possible solutions and communicate them to System Engineering. Failed Motor Master and fan motor from SACC-IB are with Carrier for failure analysis. During the inspection a discrepancy was identified in the installation of the # I fan motor on SACC-I A. The fan blade was found installed approximately 2" lower than the elevation recommended in VYEM 175. In addition the fan motor bearings sounded degraded.

Future Actions:

- WO 03-004853-000; ADJUST THE FAN BLADE ASSEM IAW. VYEM 0175. Adjusting the fan blade will not correct the long term problem of condenser reliability but is expected to resolve the current high pressure trip problem. The work order was originally written to address the fan blade hitting the motor mount; it was later identified the fan blade was installed about 2" lower than specified in the VYEM. This condition will reduce fan performance and could account for system trips on high pressure. This work order should be implemented along with the evaporator repair.

- WO 03-004851-000; REPLACE THE # 1 FAN MOTOR FOR SACC-l A. The fan motor is less than one year old, but during Carrier inspection the motor exhibited bearing noise when the unit secured from operation. This problem is not believed to be a contributor to system trips on high pressure. **Complete; 1/13/2004**

Item 3, SACC-l AIB Reliability:

Completed Actions:

- Responses to various event reports have not resolved this issue. Preliminary evaluations have identified an apparent reliability problem with the current manufacturer supplied replacement parts.

- System Engineering has acquired information on OEM head pressure control replacement options as well and non OEM options. These options have not yet been fully evaluated for suitability.

Future Actions:

- Evaluate apparent degradation in equipment reliability and determine causes. Recommend assign CA to Maintenance Support to perform snapshot self assessment of SACC-lA/B reliability to include evaluation of PM program and system design. The assessment shall result in recommendations for changes to the PM program and any design changes deemed appropriate. The self assessment to be approved by the Site Management Team and GMPO prior to CA closeout.

Recommended due date: 2/29/2004

Item 4, SCH-l Refrigerant Migration:

- Evaluate the severity of the problem after the control upgrades installed in 2003 and determine if further action is warranted. Recommend assign CA to System Engineering to track refrigerant migration related problems through the 2003-2004 winter and evaluate need for further action. The evaluation recommendation to be approved by the Site Management Team and GMPO prior to CA closeout.

Recommended due date: 5/1/2004

Item 5, Unresolved Design Issues

Completed Actions:

- Action plan revised
- Design Issue Document Prepared and reviewed by team (Pending)

Future Actions:

- Initiate Engineering Request to evaluate design deficiencies and scope corrective actions.

Cost:

Costs for the actions described above do not require budget approval at this time. There is a potential for budget impact after completion of the assigned assessments and evaluations.

Schedule:

The schedule for work order implementation will be through the work control process with team oversight.

The schedule for self assessments and evaluations is described with the recommendations.

The schedule for future actions resulting from self assessments and evaluations will be defined after the actions are complete.

Attachments:

- Identified Design Issues