DATE: April 17, 2012

SUBJECT: SN Human Error Management

LOCATION: JSC, Regents Park III

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INTRODUCTION

Mr. Mike Nichols convened the April 17, 2012, Network Support Group (NSG) Space Network (SN) Human Error Management splinter meeting to discuss the process the White Sands Complex (WSC) is working on to reduce operations errors (refer to the presentation, *SN Human Error Management*).

MEETING

A. WSC is working on a process to reduce operations errors. It had been observed by Space Communications and Network Services (SCNS) management that WSC errors were on the increase. It was decided that a culture change was needed.

B. WSC reviewed all its Root Cause and Corrective Actions (RCCA). It was found that most of the errors were due to a lack of situational awareness and lack of attention. Software changes were difficult to get implemented and software fixes addressing system discrepancies were lagging due to customer needs. There are over 1,000 pages of Alert Notices documenting a huge amount of workarounds at WSC.

C. The goal is zero errors; although, the reality is that you will always have some errors.

D. In 2007, there were 29 errors (1 error per 4600 hours of support) – the worst year. In 2010, there were 16 errors (1 error per 10,400 hours of support) – the best year. In 2011, there were 30 errors (1 error per 5500 hours of support) – proving the need for improvement.

E. It was noted that the majority of errors were occurring on the day shift where the heaviest activities were occurring. TDRS-K testing is on the day shift. USS CR was asked to move its engineering activity to a later shift.

F. Management was worried that overtime had a relationship to the number of errors. WSC will continue to manager overtime so that it does not become a factor.

G. Mr. Nichols discussed recent improvements. There have been quite a few changes. Changes include: implementing senior management review, conducting WSC Internal Readiness Reviews (IRR) each launch, conducting pre-launch briefings with the launch support team, and performing a post mission debrief. There are also SKIP level meetings with the ops crews. Improvements were made to voice systems and voice protocols. Headset use has been mandated in the ops center. WSC is now meeting industry best practices for 3-way communications for verification. The Root Cause and Corrective Action (RCCA) process has been improved. Weekly RCCA reviews are conducted to search for possible trends and lessons learned. The Local Operating Procedure (LOP) process has been improved. Ops personnel now have access to electronic version. Procedures can be built on the fly.

H. Mr. Nichols reviewed near-tem process improvements. Steps include making recommendations for improved crew schedules, provide leadership training to Ops Supervisors, perform risk assessment on scheduled activities and staffing roles and responsibilities, and develop and implement new HU performance tools. WSC is also identifying error-prone tasks (e.g., handovers and GCMRs) and applying the tools to those tasks. He stated that WSC would like to work with external users on lessons learned. Mr. Roy Harris asked about the shifts at WSC. WSC staffs the TOCC with 4 crews. Overtime is required to fill console positions if personnel are on sick or vacation. There are day shift personnel to fill in on console as needed.

I. Mr. Nichols presented some long-term process improvement plans.WSC plans to improve situational awareness by improving displays. WSC will leverage control center visits to make TDRS Operations Control Center (TOCC) improvements. Site management has requested that System Engineering evaluate O&M processes.

J. Mr. Nichols stated that WSC has identified at-risk practices – what do we do routinely that puts the SN and Operators at risk for an error? These items were noted when there was a review of 3 years of Operator Errors (OE). He provided several examples: not understanding the intent of a procedure step before performing it, self checking with referencing an LOP, or not identifying critical steps and activities in advance.

K. Mr. Nichols reviewed the Human Performance Tools. WSC looked at tools used in industry. International Atomic Energy Agency (IAEA) and Department of Energy (DOE) tools were evaluated. Fourteen new tools are being developed for use at WSC. Safer is one tool. One tool is for operators to repeat communications vice just responding COPY or STANDBY. Critical steps will be summarized in briefings. Independent verification will be exercised. Communication back to the crews will be improved.

L. Mr. Nichols stated that WSC is looking at error categories. Four categories have been defined:
    1. Disregard for procedure or policy – skipped step.
    2. Poor procedure or policy – poorly written step.
    3. Failed device or SW with established workaround – workaround not followed.
    4. Heat of battle – actions taken to control a time critical anomaly.

M. Mr. Nichols provided a list of useful documents.

N. Mr. Bangerter stated that the effort had matured quite a bit since what he had seen last month. Mr. Bob Hudgins stated that it used to be that it was believed a second-person verified step could not go wrong. But there were failures many times. Mr. Earl Baum asked how successful has the effort been in making a cultural change. Mr. Nichols stated that initially only Human Resources (HR) tools were used. This was counterproductive. This has gotten their attention and the operators want to improve. Mr. Harris asked if displays are changed when process changes are made. Mr. Nichols replied yes. Software changes are not quick however. There are 150 alert notices against the latent system design flaws. WSC is working on a very detailed training package.

ACTION ITEM REVIEW

No action item was assigned at the April 17, 2012, NSG SN Human Error Management splinter meeting.

(Original Approved By)
Mike Nichols/WSC