



***NORTHROP GRUMMAN***

DEFINING THE FUTURE

# Strategies for Communicating Human Systems Integration Findings

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# Human Factors Challenge

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Challenge: Guaranteeing that design modifications recommended by Human Factors are properly communicated and tracked.

# Ground Systems HF Effort



- Ground Systems Human Factors Effort Overview
  - Usability Testing
  - Operability Testing
  - Workload Analysis
  - Performed by Human Factors Practitioners
  - Rely heavily on Operator Community Participation

\*Necessary to guarantee ground systems software is usable, safe and enables the operator to complete their mission successfully.

REQUIRES EFFECTIVE COMMUNICATION OF HUMAN FACTORS FINDINGS TO SYSTEM DESIGNERS.

# Communication of Recommendation

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- Human Factors findings must be translated into a design modification to be useful to designers.

**HF finding:** “Operator experienced frustration when interpreting the numeric data on the GUI.”

**Design Recommendation:** “Include proper field labels for each numeric data field and label each field clearly with units.”

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*Software and Test track software discrepancies extensively, shouldn't Human Factors?*

**Problem:** HF findings and problem resolutions are generally not appropriate for Problem or Discrepancy report databases.

**Solution:** An HF issue specific tracking system.

# Human Factors Database

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## Benefits of a Human Factors Database:

- Solicits communication between Software and HF
- Holds team responsible for adjudicating Human Factors design concerns
- Documentation of historical data
- Enables compilation of historical data
- Enables report generation for stakeholders

# DB Development & Maintenance

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- Implementation
  - Database development
  - Ongoing maintenance
  - Ongoing support to users

# DB Development & Maintenance

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- Database Development

- DB Creation

- In house (Microsoft Access) or COTS PR/DR Tool

- Information to capture:

- Finding, HF Evaluator, ID, Date, POC, Software/Product Domain, Status, GUI or Element name, Delivery Plan Information, Reference Information



# Case Study

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- Program: Ground Systems Software Product
  - Scope of product: 200+ GUIs
- HF Requirements/Objectives:
  - Usability (Style Guide Compliance)
  - Operability
  - Workload

# Case Study (cont.)

- HF Participation:

requirements reviews, informal prototype reviews, informal discussions with software, formal software peer reviews, informal meetings with training, stakeholder meetings, support to integration and verification, HF analyses of software interfaces, formal operator testing

\*To date this effort has generated hundreds of findings that should be incorporated into the software design to improve usability, operability and reduce workload

# Case Study (cont.)



Database and process implemented to manage HF findings....

- Benefits:

- tracking, metrics, facilitates communication, gives customer an understanding of the scope of closed and unclosed items, historical data, each and every HF concern is documented, accessible and tracked

- Current status:

- database contains over 1000 items, many of which have been resolved or are planned for future software builds

# Lessons Learned

## Lessons learned:

- Database access should be limited
- Regularly scheduled meetings with HF and software are key
- Each finding should refer to just one GUI or product element
- Consistent list of GUI titles/product elements is necessary