ULSGEN
(Uplink Summary Generator)

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Agenda

• Uplink summary process and how we use software to streamline the process
• Software design concept
• Adaptation concept in a multi-mission environment
• ULSGEN architecture
• ULSGEN in operation
• Conclusion
Uplink Summary

• Uplink is an important part of S/C operation.
• Before radiation, everyone involved is required to review the uplink products.
• Uplink files are parsed and analyzed to generate an uplink summary for review.
• Spacecraft operations personnel view this summary as a final check before actual radiation of the uplink data.
Uplink Summary Process

- Collect uplink files
- Parse & analyze files
- Generate uplink summary
- Electronic approval
- Approval

Introducing software (ULSGEN) in this process to:
- Collect uplink files and arrange their order in a convenient interface
- Parse & analyze uplink files to generate an uplink summary in mission-specific form
- Start electronic signature cycle with notifications
- Collect review comments and signatures
- Handle rejection and its notifications
- Configuration manage changes made to the uplink summary
- Generate reports and an XML file for radiation preparation
- Archive uplink summary data and provide ability to search that data
Software Design Concept

• Code reuse to reduce development effort
  – Take reusable pieces from other implementations
  – Use developers from other similar tasks
• Multi-tier implementation for flexibility
  – Separate UI, business logic, and data layer
• Browser based app to simplify deployment
• Web services for automation
  – Both REST and SOAP services
  – REST services for automation via scripting
• Authentication and authorization to enhance security
  – LDAP-based authentication
  – Use secured connections (HTTPS)
  – Authorization via workspace permissions
Adaptation

• Adaptation required for each mission
  – Common capability is provided to all missions
  – Mission-specific capability can be added to satisfy individual needs

• Adaptation capabilities:
  – Parsed data via file parser extension
  – Captured data via data template
  – Data structure via dataset template
  – Data view via uplink summary and report templates
For example, Mars Science Laboratory (MSL) has bundled sequences in the SCMF file. The common SCMF parser does not generate that information. Therefore, an MSL-specific SCMF parser was derived from the common SCMF parser to generate data with bundled sequences.
Adaptation
(Data template)
Adaptation
(Dataset template)

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<tr>
<th>Mission A</th>
<th>Mission B</th>
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<td>Contingency files</td>
<td>Main files</td>
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<tr>
<td>Signatories</td>
<td>Contingency files</td>
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</tbody>
</table>

Tabletop signatories
Product review signatories
Test review signatories
Summary signatories

*Datasets can be dynamically arranged*
Adaptation
(Report template)
ULSGEN Software Architecture

- ULSGEN Portal (PHP)
- ULSGEN SOAP (Java EE)
- ULSGEN REST (Restlet)
- Automation scripts
- File parsers (Java+C)
- File system
- Linux
- MySQL
- User’s Web browser
- Database Access (JDBC)
- Controllers (Java)
- Database
- Glassfish
- NuSOAP
ULSGEN in Operation
Workspace Listing

Workspace: a collection of uplink summaries that have similar characteristics and usage

Creator of the workspace can assign/change workspace permissions
Uplink Summary Listing

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<tr>
<th>Status</th>
<th>Name</th>
<th>Description</th>
<th>Version</th>
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Next 20
Generate an Uplink Summary

Uplink summary configuration:
1. Data template for uplink file
2. Dataset structure
3. Uplink files and order
4. Signatories
5. Notifications to whom and when
6. Uplink window file
Edit a generated uplink summary to create a minor version.

Configurability of overwritten fields.
Signature Cycle

Signers receive emails based on the options selected during configuration.
Uplink Summary

Uplink summary can be saved to a PDF file

Other reports such as RadList can be generated

REST web services are provided for easy automation
Conclusion

• ULSGEN provides both uplink summary generation and signature cycle capabilities.
• Adaptation provides flexibility in a multi-mission environment.
• ULSGEN improves the efficiency of uplink review process.
• ULSGEN reduces the risk of human errors.