INtools — What? Why? How?

Owner / Operator Mode
Managing Concurrent Engineering
What is INtools

INtools is one of the foremost Instrumentation engineering applications supplied by Intergraph.

The software works very well in the engineering environment however when used in the Owner Operator Mode special considerations / precautions must be enforced.

“The Business Owner must understand the value of the data”
Why INtools?

• We do not want to build or customize applications. The intention is to use “out-of-the-box” software.
• INtools is the instrumentation design tool used by the majority the EPC firms, by default it is “the” industry standard.
• The features provided by INtools are required by major engineering projects.
• With the application being managed by the Owner Operator we have the opportunity to recommend changes to Intergraph.
• The data is used by more than designers and maintenance people. It is used by planners, financial and accounting.
What is in INtools

The database can contain:

- All of the physical Instrumentation tags (engineered, procured, maintained)
- The other Tags – (Start / Stop signals, etc)
- Wiring details for I/O connected to the PCN
- Engineering data – change that will happen
- Current data – what is in the Plant right now
- As Built data – “official” record of the Plant
- Decommissioned Tag data – what was in the Plant
- Historical (revisions) datasheet information
How does INtools help the O/O

• Single source of Instrumentation data.
• Brings the different operating centers together in one database.
• Defined and accepted the instrumentation naming convention.
• Provides a logical location to store Tag information such as calculation sheets.
• Provides the ability to request data in numerous ways.
• The most challenging item is to bring the awareness to the non-user the vast amount of data available.
Use of INtools in Owner Operator Mode

Owner Operator Mode

• Enforces the Plant’s tagging conventions, revision control and system “rules” for all engineered work.

• Requires the EPC firms to take more ownership of the engineered data from Design through to Operations, As-Built.

• External audits can been done to validate the project deliverables for Turnover and As-Building. This helps to ensure the data meets the Plant’s expectations.

• Physical asset information is going to be used to populate other system like the maintenance system.

• Data must be available for operations and engineering.

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Preparation for O/O Mode

The Site must have a plan…. 

- Who will administer the application? 
  - “IT” will supply a connection for all users 
  - “Systems” group will support the server(s), the database tables, operating system, etc 
  
  This is not a program that can be managed without an understanding of what is the intent of the deliverables. 

- Who is the owner of the Plant Specification for the database? 
- Who is the owner of the internal documents, the datasheet templates? 
- Who is the custodian of the process that ensures that the Engineering projects are complete? 
- Who is the owner of the “As-Building” process? 
- Someone must be responsible and accountable for the software. Bugs, patches, upgrades, integration with other systems, data transfers, etc
Use of INtools in Owner Operator Mode

Why - Application Support?

- Application Support includes:
  - Merge/Claim prior to normal Business hours 5:30-7:30 am
  - For Merge and Claim users must be locked out
  - Off hours and weekends activities - CheckDB fixes
  - Helpdesk / User support
  - Training for the users, specific to Plant usage
  - Tag and Loop assignments
  - Revision Control
  - INtools As-Builting
  - Creation, Audits & Closure of engineering projects
  - Adding and removal users including access rights
Use of INtools in Owner Operator Mode

INtools Administrators

• Not a typical IT application, special skills are required
  – Is this an Instrumentation person or a Software person?
• There are limited ways to learn how be an effective / efficient INtools Administrator
• What software tools are going to be allowed?
• What access to the database tables will be allowed?
• Who runs the CheckDB?
  – Who implements the fixes
  – CheckDB does not catch everything
  – When to run rebuild of Triggers and Procedures
Creation of Multiple Projects

Pro’s

- Enforces the philosophy that an engineered change must happen outside the “As-Built” environment.
- Allows for concurrent engineering.
- Security of data.
- Simplicity to complete audits.
- Ease of As-Building.

Con’s

- Additional database support.
- Multiple revisions to the same tag.
- External search tools maybe required.
All engineering changes are required to be done in separate INtools projects.

There is a fundamental limit to projects that can be created and maintained.

INtools engineering projects are removed after As-Building and the merge is complete.
Merging Questions

Example:
What is needed to know to merge one wired Loop with five Tags (PT, PV, PY, PZSO & PZSC)
  - Are they new or claimed items?
  - How many Panel / Strips?
    - Do any of the Panels or the Strips need to be reclaimed?
  - Which Terminals?
    - Are there any Terminals that do not have signals?
  - Any General Signals?
    - What Lines are used?
      - Are they new or claimed?
    - What Equipment is used?
      - Are they new or claimed?

Getting any of these questions wrong can create dummy records. The software will merge what you asked for but necessarily not what you wanted.
As an INtools Administrator you really need to know the Plant data

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Group Privigley Table

Group privigley table size is a function of:

   Plants * Projects * User Groups = Table Size

The larger the table the more impact on performance

As administrators we can not change the number of Plants that are in the facility

What we can influence is Projects and User Groups:

   – Projects tend to linger if not managed
     – User groups can get large if too many rules are added
Use of INtools in Owner Operator Mode

Multiple Revisions

• If the revisions are not As-Built in a suitable timeframe the “copies” can spread through out the database.

• Custom external search engine, reports

<table>
<thead>
<tr>
<th>Project Name</th>
<th>Tag Name</th>
<th>Rev No</th>
<th>Revision Desc</th>
<th>Loop Name</th>
</tr>
</thead>
<tbody>
<tr>
<td>AS BUILT</td>
<td>23 -4 -FE -1</td>
<td>3</td>
<td>ISS MIGRATION CORRECTION</td>
<td>23 -4 -F -1</td>
</tr>
<tr>
<td>RAPID DEVELOPMENT</td>
<td>23 -4 -FE -1</td>
<td>3B</td>
<td>ISSUED FOR CONSTRUCTION</td>
<td>23 -4 -F -1</td>
</tr>
<tr>
<td>AS BUILT</td>
<td>23 -4 -FIT -1</td>
<td>3</td>
<td>AS BUILT PER MOC 13511 REV 2</td>
<td>23 -4 -F -1</td>
</tr>
<tr>
<td>RAPID DEVELOPMENT</td>
<td>23 -4 -FIT -1</td>
<td>3A</td>
<td>ISSUED FOR CONSTRUCTION</td>
<td>23 -4 -F -1</td>
</tr>
<tr>
<td>SCL EXTRACTION</td>
<td>23 -4 -FIT -1</td>
<td>2A2</td>
<td>UPDATED PER WO 7076441</td>
<td>23 -4 -F -1</td>
</tr>
</tbody>
</table>
Problem: Project B wants to make a change on Project A’s datasheet and there is an existing revision in As Built.

1. Create a new Holding project
2. Step 1 claim tag to Holding
3. Step 2 merge tag to As Built
4. Step 3 claim tag back to Project A
5. Step 4 claim tag to Project B
6. Step 5 merge tag to As Built
7. Apply a soft revision in Project B
Use of INtools in Owner Operator Mode

### Merge of Tags - Datasheets

#### As Built Record

<table>
<thead>
<tr>
<th>REV NO</th>
<th>DATE</th>
<th>REVISION</th>
<th>BY</th>
<th>INSTR APPR</th>
<th>PROC APPR</th>
</tr>
</thead>
<tbody>
<tr>
<td>5</td>
<td>2004/09/07</td>
<td>AS BUILT FILE.052 REV.3</td>
<td>ZN</td>
<td></td>
<td></td>
</tr>
<tr>
<td>4</td>
<td>2003/01/15</td>
<td>MIGRATION-CHECK DS ATTACHMENT</td>
<td>INGR</td>
<td></td>
<td></td>
</tr>
<tr>
<td>3</td>
<td>2001/11/06</td>
<td>AS BUILT PER TWR # 08-6640</td>
<td>JL</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

#### Project 1 Record

<table>
<thead>
<tr>
<th>REV NO</th>
<th>DATE</th>
<th>REVISION</th>
<th>BY</th>
<th>INSTR APPR</th>
<th>PROC APPR</th>
</tr>
</thead>
<tbody>
<tr>
<td>7</td>
<td>2005/12/23</td>
<td>AS BUILT AS PER UE-1 REV.4A</td>
<td>FJP</td>
<td></td>
<td></td>
</tr>
<tr>
<td>4A</td>
<td>2005/08/08</td>
<td>ISSUED FOR CONSTRUCTION</td>
<td>ME</td>
<td></td>
<td></td>
</tr>
<tr>
<td>4A1</td>
<td>2003/04/02</td>
<td>ISSUED FOR TWR# 1003466</td>
<td>DWA</td>
<td></td>
<td></td>
</tr>
<tr>
<td>4</td>
<td>2003/01/15</td>
<td>MIGRATION-CHECK DS ATTACHMENT</td>
<td>INGR</td>
<td></td>
<td></td>
</tr>
<tr>
<td>3</td>
<td>2001/11/06</td>
<td>AS BUILT PER TWR # 08-6640</td>
<td>JL</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

#### Project 2 Record

<table>
<thead>
<tr>
<th>REV NO</th>
<th>DATE</th>
<th>REVISION</th>
<th>BY</th>
<th>INSTR APPR</th>
<th>PROC APPR</th>
</tr>
</thead>
<tbody>
<tr>
<td>6</td>
<td>2005/09/08</td>
<td>PSI-ISSUED AS FOUND</td>
<td>JB2</td>
<td></td>
<td></td>
</tr>
<tr>
<td>4Z1</td>
<td>2005/06/24</td>
<td>PSI - IN PROGRESS</td>
<td>RG1</td>
<td></td>
<td></td>
</tr>
<tr>
<td>ZZ</td>
<td>2004/03/04</td>
<td>PSI SNAPSHOT FOR COMPARISON</td>
<td>JB2</td>
<td></td>
<td></td>
</tr>
<tr>
<td>4</td>
<td>2003/01/15</td>
<td>MIGRATION-CHECK DS ATTACHMENT</td>
<td>INGR</td>
<td></td>
<td></td>
</tr>
<tr>
<td>3</td>
<td>2001/11/06</td>
<td>AS BUILT PER TWR # 08-6640</td>
<td>JL</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

We cannot blindly merge these records back into As Built. Revisions may need to be deleted and ID’s sorted

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What we want for revisions

The revision block must be manipulated to ensure the end result in the As-Built section of the database captures the correct sequence.
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Complex Loop – INtools

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Areas for Improvement

• INtools is not user friendly for the casual user (maintenance / operations).

• Revision control and archive functionality needs to be enhanced.

• A method to determine when a datasheet is undergoing change between revisions.

• Wiring profile creates issues when Merging and Claiming tags. Use of Foundation Fieldbus has unique problems in the Claim

• Complex data moves maybe required to support Engineering and As-Building

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Thank You

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