

PROMS Human Factor Functionality

This whitepaper on the Volian Enterprises application, called PROMS, provides a description of the many human factors capabilities that are integral to its design and actually have been used extensively by PROMS users over many decades in the field. These human factors capabilities are very important to maximize the procedure quality while reducing the costs associated with their creation and maintenance. Note that PROMS is at 18 nuclear sites in the USA with customers loyal to the application over many decades. Volian's point is that we have actual successful experience versus being part of a prototype or experiment from one of our competitors. PROMS is not just a procedure editor. PROMS is a procedure maintenance tool designed with human performance in mind, especially for high-risk environments. Its human factor-related strengths have been demonstrated utilizing the following HF features:

1. Reference Objects store action step criteria and equipment, keeping critical values consistent across procedures through managed hyperlinks

PROMS Human Factors Workplace Example:

Referenced Objects with its database design, which our users have used for decades, address the need to efficiently handle the substantial number of alarm points in a digital control room, which can surpass 10,000-plus Main Control Room alarms. PROMS provides this support by utilizing our Referenced Object (RO) database to store the information and automatically populate the Alarm Point information tables in the PDF output or as input into an electronic procedure system. Periodically, the I&C Department for the nuclear power plant updates this information. PROMS has established a built-in process to minimize the effort to update the affected alarm point procedures.

PROMS Human Factor Benefits

- a. Identifies when values have changed.

[Human Factor: Prevents human error caused by inconsistent or outdated values.]

- b. One value is maintained, but referenced in multiple areas. This feature promotes consistency in terminology and equipment references.

[Human Factor: Improves trust in procedures since users know values are globally consistent.]

- c. Maintained in its own database to give the procedure writer control over when to implement changed values.

[Human Factor: Creates a buffer against unintended consequences by not immediately implementing changes made by non-procedure writers.]

- d. Values displayed in multiple user-selectable content, each offering a different level of detail and information. For example, for a piece of equipment. The Referenced Object database can store a wide variety of information such as the Equipment ID, Verbatim label, common name, and location. The plant Writer's Guide can specify the allowable combinations and the procedure writer can determine which combination is placed in the procedure.

[Human Factor: Enhance usability and operational performance.]

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2. Managed step transition hyperlinks

PROMS Human Factors Workplace Example:

PROMS manages three types of transitions i.e. 1) “inside” reside in the home procedure, 2) “external” resides in the home procedure set and 3) “outside” is maintained by PROMS and resides outside the home set. Unlike other procedure maintenance applications that have simple hyperlinks, PROMS stores the beginning and ending addresses. This is a much more robust handling for transition hyperlinks. These step transitions keep the user on the correct path, reduce the risk of missed or out-of-order actions, and support efficient, accurate task execution. In addition, Volian has extended transition functionality to the PROMS pdf output. Simply clicking on a transition link in the pdf file will take the user to the end point address location.

PROMS Human Factor Benefits

a. Seamless procedure navigation.

[Human Factor: Reduces navigation errors by guiding users logically through procedures.]

b. Links update automatically with step additions and deletions.

[Human Factor: Improves efficiency by eliminating manual updating of step numbers.]

c. The user can follow the hyperlink path by following the link where PROMS will display that location in both the PROMS editor and the procedure output pdf.

[Human Factor: Ability to simply and directly review and modify the transition flow in the procedure(s), if necessary.]

3. Consistent procedure format and structure

PROMS Human Factors Workplace Example:

An underlining principle in the PROMS design is maintaining separation between the format and the procedure content. This is unlike many procedure applications, especially those based on word processors like Microsoft WORD. PROMS lets procedure writers focus on content, not formatting. By presenting steps, cautions, and warnings in a consistent format, operators can quickly locate critical information while doing all types of procedures. This familiarity reduces the need to interpret layout, helping prevent missed steps and misread instructions—ultimately improving accuracy and reducing human error in high-stakes situations.

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- a. Unique step numbering and structure for Single and Two Column procedures.

[Human Factor: Improves readability and comprehension through predictable structure.]

- b. Consistent ordering of Notes, Cautions and Warnings.

[Human Factor: Reduces interpretation errors by standardizing where critical information appears.]

- c. Automatic top and bottom continuation messages for steps that exceed one page.

[Human Factor: Reduces omission risk for actions contained on multiple pages.]

- d. Automatic identifiers for special step types such as Continuous, Immediate and Time Critical Action Steps.

[Human Factor: Prioritizes critical actions so users know what requires immediate attention.]

[Human Factor: Improves decision-making speed during emergencies.]

[Human Factor: Reduces omission risk for high-importance steps.]

- e. Automatic emphasis of Action Verbs derived from the Writer's Guide.]

[Human Factor: Enhances clarity by explicitly highlighting required actions.]

4. Intelligent Pagination

PROMS Human Factors Workplace Example:

PROMS intelligent pagination feature enhances human factors in the nuclear industry by reducing the risk of procedural errors during time-critical operations. Notes, Cautions and Warnings are placed on the same page as it's applicable step. If a page break is needed, then PROMS utilizes complex human factors logic to determine the optimal location to split the step. If a step is paginated, then PROMS automatically places a continued message per the Writer's Guide.

PROMS Human Factor Benefits

- a. Designed to maintain step continuity within a single page.

[Human Factor: Maintains task continuity by avoiding page breaks within steps.]

- b. Logical grouping of various step elements.

[Human Factor: Minimizes missed information.]

[Human Factor: Improves usability during physical or digital procedure execution.]

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5. Tools to allow for text standardization across procedures

PROMS Human Factors Workplace Example:

In a nuclear power plant during an event, operators using PROMS-generated procedures can quickly access consistent valve alignment steps and standardized safety cautions; this ensures that critical actions are performed uniformly and correctly, improving reliability, compliance, and overall plant safety.

PROMS Human Factor Benefits

- a. Common Procedure Sections.

[Human Factor: Improves efficiency for writers and reviewers, reducing human input errors.]

- b. Database of standard text values.

[Human Factor: Ensures consistency in terminology, reducing ambiguity.]

- c. Find similar wording through robust database searches.

[Human Factor: Prevents misinterpretation from varied wording of similar tasks.]

6. Parent/Child Procedure Management

PROMS Human Factors Workplace Example:

The Parent/Child Publishing Capability (P/C PC) functionality supports multiple units at a single site by effectively managing variations between the units. In plants with digital control rooms, the volume of Alarm Points increases proportionally with the number of units, making scalable management essential. PROMS has demonstrated this capability by successfully supporting a four-unit site with a digital control room for several years.

PROMS Human Factor Benefits

- a. Automatic generation of context-specific child procedures from a parent procedure.
- b. Saves editing time for multi-unit procedure sets.

[Human Factor: Eliminates the need to make the same change in multiple units.]

7. Workflow, Version Control & Change Visibility

PROMS Human Factors Workplace Example:

Structured workflows guide procedure writers' step-by-step, minimizing reliance on memory and reducing the likelihood of procedural errors. Version control ensures that only the latest approved procedures, drawings, or safety documents are in use, eliminating confusion caused by outdated or conflicting information. Change visibility provides clear audit trails and highlights modifications, enabling workers to quickly understand what has changed and why, thereby improving situational awareness and decision-making.

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PROMS Human Factor Benefits

- a. Tracks complete history and separates approved vs. working versions.

[Human Factor: Operators always access the correct, approved procedure.]

[Human Factor: Reduces risk of using outdated or conflicting instructions.]

- b. Supports safe “pen-and-ink” updates without disrupting drafts.

8. Annotations

PROMS Human Factors Workplace Example:

Writers can use annotations to capture lessons learned, clarify intent, and highlight critical parameters without cluttering core steps. For example, in a valve alignment procedure, an annotation can note a past near-miss and specify acceptable pressure ranges. This results in clearer, more user-focused procedures that reduce error risk and support safe execution.

PROMS Human Factor Benefits

- a. Allows annotations directly on steps, sections, or procedures.

[Human Factor: Provides additional explanation, cautions, or operational insights.]

[Human Factor: Supports learning and knowledge transfer.]

- b. Notifies procedure writer when transition link locations need reviewed due to additions and deletion of steps.

[Human Factor: Prevents invalid references and ensures continuity.]

9. User Interface (UI) Design

PROMS Human Factors Workplace Example:

The PROMS UI improves human performance by providing an easy-to-use interface for the procedure writer. Large ribbon buttons reduce mis-clicks, the tree view hierarchy enables intuitive navigation, and side-by-side editing supports quick validation. For example, a procedure writer that needs to enter a new step into a procedure can easily find similar steps in the procedure network to ensure the new step conforms to existing guidance.

PROMS Human Factor Benefits

- a. Ribbon/tabs with large buttons.

[Human Factor: Supports different work styles (novice vs. expert users).]

- b. Tree hierarchy views.

[Human Factor: Improves ease of navigation and interaction.]

- c. Side-by-side editing.

[Human Factor: Minimizes errors that could occur when switching between documents.]

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10. Multi-User Control & Error Prevention

PROMS Human Factors Workplace Example:

When a procedure writer opens a procedure to revise it, others can view but not edit it, preventing conflicting updates. This structured control reduces human error, ensures procedural accuracy, encourages communication, and supports nuclear safety compliance.

PROMS Human Factor Benefits

- a. Check-in/check-out prevents simultaneous conflicting edits.
- b. Role-based security controls access.

[Human Factor: Reduces human error due to version conflicts or unauthorized changes.]

[Human Factor: Improves accountability and traceability.]

11. Reporting & Traceability

PROMS Human Factors Workplace Example:

PROMS enhances situational awareness and error prevention by automatically logging transitions and linking each step to validated plant components, documents, or system states. Its reporting features further support validation by enabling the writer to review procedure text in the context of updated transitions and associated referenced object values.

PROMS Human Factor Benefits

- a. Links between steps (transitions) and usage of Referenced Objects.

[Human Factor: Helps users understand dependencies and system behavior.]

[Human Factor: Supports verification and validation activities.]

12. Integration with Word for Flexibility

PROMS Human Factors Workplace Example:

PROMS integration with Microsoft Word also supports human factors by allowing less rigid formatting for supporting content types—such as cover pages, complex figures and tables, version summaries, etc.—while still maintaining structured control over safety-critical steps.

PROMS Human Factor Benefits

- a. Allows free-form editing where strict structure is not ideal.

[Human Factor: Balances structure vs. flexibility.]

[Human Factor: Supports content types that benefit from less rigid formatting.]

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Key Human Factors Themes in PROMS

Human Factors Principle	How PROMS Supports It
Reduce cognitive load	Structured formats, global search, referenced objects
Improve situational awareness	Context-specific procedures, searchable annotations
Ensure consistency	Standard formatting, shared data objects
Prevent human error	Version control, single-editor enforcement
Support usability	Intuitive UI, navigation tree, flexible workflows
Enhance decision-making	Embedded data, reports, annotations

Artificial Intelligence (AI) Disclosure:

Portions of this document were generated with the assistance of artificial intelligence (AI) tools. The content has been reviewed and, where necessary, edited for accuracy and relevance.