

2397A Watson Analytics Aid Nuclear Safety Reviews in IBM Case Manager

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Watson
2016**





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- The U.S. Nuclear Regulatory Commission (NRC) was created to ensure the safe use of radioactive materials for beneficial civilian purposes while protecting people and the environment.
- The NRC regulates commercial nuclear power plants and other uses of nuclear materials through licensing, inspection and enforcement of its requirements.



- A Safety Evaluation Report (SER) is an NRC produced document that represents an independent audit of the applicants analysis.
- The SER documents the safety and security technical bases for the NRC's disposition of a licensing action.

Licensing, Inspection and Enforcement of requirements



Analysis of massive amounts of technical information

- Information must be shown in association with related details to expose complex interactions
- Watson Analytics integration with IBM Case Manager keeps these associations together
- Knowledge Management in a Case

IBM Case Manager with DITA

- Collaborative authoring of review findings with DITA (Darwin Information Typing Architecture)
- DITA files managed in a Case

NRC Safety Review Characteristics

Complex analysis of massive amount of technical details

Duration of 6 months to years

Staff changes during Review

Collaborative Review by many

Collaborative authoring of findings

Authors should focus on content, not formatting

Need improved Guidance for consistent Review and efficiency

Need improved Knowledge Management

Need improved Reference library

Management oversight improvements needed

Real-time statistics needed

Retention of all related work

Review Status at a Glance

Glance at Review tree icons to quickly identify status - completed, issues, WIP, not relevant items

For Each item, there's a review Question, Status selection, and detail about the item

The screenshot displays a software interface for reviewing documents. On the left, a 'Review Structure' tree lists various items, each with a status icon: green checkmarks for completed items, yellow gears for items in progress, and red exclamation marks for issues. The tree includes folders like 'Setpoint Methodology', 'Regulatory Basis', and 'Technical Evaluation', along with specific items like 'Introduction', 'Previously Reviewed Applications', and 'Conformance to Guidance'. On the right, the 'Detail' view for a selected item shows a 'Status' section with radio buttons for 'Work In Progress' (selected), 'Affirmative', 'Negative', 'Not Relevant', 'Issue', and 'RAI'. Below this is a 'Question' field with a dropdown menu. A horizontal tab bar contains 'SER' (selected), 'Working Notes', 'Comments', 'Why Question', 'Tribal Wisdom', 'References', and 'RAI'. The 'Preview' section shows a large heading '1 Conformance to Guidance' followed by a paragraph of placeholder text. At the bottom, there are buttons for 'Edit in MS Word' and 'Refresh Preview', and a status bar with 'Save', 'Undo', 'Toolbar', 'Status', and 'Question Author'.

Review Structure

- Setpoint Methodology
 - Introduction
 - ✓ Title
 - ✓ Introduction (Template)
 - ✓ Previously Reviewed Applications
 - ⚙ Referenced Documentation in the Licensing Basis
 - Regulatory Basis
 - ✓ Regulatory Basis (Template)
 - Summary of Application
 - ✓ Summary of Application (Template)
 - ⚠ Additional Purposes for Methodology
 - ⚙ Conformance to Guidance
 - ⚠ Define Setpoint Terminology
 - ⚠ Setpoint Relationships
 - ✗ Uncertainties and Their Combination
 - ⚠ Facility Setpoint List
 - ⚠ Setpoints for Procedural Actions
 - ⚠ New regulation
 - Technical Evaluation
 - ⚠ Technical Evaluation (Template)
 - ⚠ Properly determine Limiting Safety System Setting (LSSS) so it protects AL
 - ⚠ Relationship Between Allowed Value and As-Left As-Found Tolerances

Detail

Status:

☒ Work In Progress ☐ Affirmative ☐ Negative ☐ Not Relevant ☐ Issue ☐ RAI

Question: Other

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SER Working Notes Comments Why Question Tribal Wisdom References RAI

Preview

1 Conformance to Guidance

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SER Actions











Edit in MS Word Refresh Preview

Save Undo Toolbar Status Question Author

Active Reviews with Real-Time Statistics

Automatic real-time statistics shown for Review in-baskets

Management opens to see details of Review

see details of Review			Review Type	Complete %	RAI Count	Issue %	Scheduled Due Date	Project Manager	Reviewer	Status	Assigned Date	
	2016.07.21-0077MG	PILGRIM NUCLEAR POWER STATION -ISSUANCE OF AMENDMENT REGARDING REVISED TECHNICAL SPECIFICATIONS FOR SETPOINT AND SETPOINT TOLERANCE INCREASES FOR SAFETY RELIEF VALVES AND SPRING SAFETY VALVES Report Type	Technical Specification Action Item	11	0	0	12/23/2016	Ghneim, Munira (msg)		Under Review	7/21/2016 12:00 AM	
	Dockets 50-275, OL-DPR-80, 50-323, OL-DPR-82	Diablo Canyon Power Plant Units 1 and 2 Flood Hazard Re-evaluation	Flood Hazard Reevaluation	1	0	0	02/09/2017	Ghneim, Munira (msg)	Ghneim, Munira (msg)	Under Review	8/17/2016 12:00 AM	
	2016.07.19-1431BW	Babcock and Wilcox mPower, Inc. (B&W mPower) Instrument Setpoint Methodology Topical Report	Setpoint Methodology DITA	6	0	2	09/30/2016	Ghneim, Munira (msg)	Sundquist, Ulf (ups1)	Withdrawn	8/29/2016 12:00 AM	
	Docket 52-012 and 52-013	STP Methodology for South Texas Project Units 3 and 4 Submittal of Topical Report	Setpoint Methodology	0	0	0	10/31/2016	Ghneim, Munira (msg)	Ghneim, Munira (msg)	Under Review	8/16/2016 12:00 AM	
	2016.07.21-mg2	Clarifications to Final Safety Evaluation for Extended Power Uprate License Amendment No. 174	Setpoint Methodology	3	0	7	07/27/2016	Ghneim, Munira (msg)	Ghneim, Munira (msg)	Under Review	7/25/2016 12:00 AM	
	2016.07.27-16	ACCEPTANCE FOR REFERENCING OF LICENSING TOPICAL REPORT EMF-92-081, REVISION 1, STATISTICAL SETPOINT TRANSIENT METHODOLOGY FOR WESTINGHOUSE TYPE	Setpoint Methodology	10	1	0	08/08/2016	Ghneim, Munira (msg)	Young, Gary (gxy)	Under Review	8/1/2016 12:00 AM	
	Dockets 50-317, 50-318	CALVERT CLIFFS NUCLEAR POWER PLANT, UNITS 1 AND 2 - SUPPLEMENT TO STAFF ASSESSMENT OF RESPONSE TO 10 CFR 50.54(f) INFORMATION REQUEST-FLOOD-CAUSING MECHANISM REEVALUATION (TAC NOS. MF3097 AND MF3098)	Flood Hazard Reevaluation	0	0	0	08/02/2016	Ghneim, Munira (msg)	Ghneim, Munira (msg)	Under Review	8/18/2016 12:00 AM	
	Docket 50-305	Wisconsin Public Service Corp LER 9300600 on 930322, non-conservative condition identified-for LTOP setpoint development.	Setpoint Methodology	0	0	0	11/23/2016	Ghneim, Munira (msg)	Ghneim, Munira (msg)	Under Review	8/1/2016 12:00 AM	

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Displaying 25 items per page of total 17

Structured Guidance for Consistent, Efficient Review

The screenshot displays a software interface for structured review guidance. The interface is divided into two main sections: a 'Review Structure' pane on the left and a 'Detail' pane on the right.

Review Structure Pane:

- Buttons: Edit, Insert, Delete, and a toolbar with icons for document, list, and search.
- Tree Structure:
 - Emails
 - Previous Reviews
 - References & Regulations
 - Setpoint Methodology
 - Introduction
 - Title (checked)
 - Introduction (Template) (checked)
 - Previously Reviewed Applications (checked)
 - Referenced Documentation in the Licensing Basis (warning icon)
 - Regulatory Basis
 - Regulatory Basis (Template) (checked)
 - Summary of Application
 - Summary of Application (Template) (checked)
 - Additional Purposes for Methodology (warning icon)
 - Conformance to Guidance (warning icon)
 - Define Setpoint Terminology (warning icon)
 - Setpoint Relationships (question mark icon)
 - Uncertainties and Their Combination (error icon)
 - Facility Setpoint List (question mark icon)
 - Setpoints for Procedural Actions (warning icon)
 - New regulation (question mark icon)
 - Technical Evaluation
 - Technical Evaluation (Template) (checked)

Detail Pane:

- Buttons: SER, Working Notes, Comments, Why Question, Tribal Wisdom, References, RA.
- Status: Work In Progress (selected), Issue, RAI.
- Question: Other (selected).
- Text: Lorem ipsum dolor sit amet, consectetur adipiscing elit, sed diam nonummy eirmod tempor invidunt ut labore et dolore magna aliquyam erat, sed diam voluptua.
- Text: Ut wisi enim ad minim veniam, quis nostrud exerci tation ullamcorper suscipit lobortis nisl ut aliquip ex ea commodo consequat. Duis autem vel eum iriure dolor in hendrerit in vulputate velit esse molestie consequat, vel illum dolore eu feugiat nulla facilisis at vero eros et accumsan et iusto odio dignissim qui blandit praesent luptatum zzril delenit augue dui dolore te feugait nulla facilisi.
- Text: Nam liber tempor cum soluta nobis eleifend option congue nihil imperdiet doming id quod mazim placerat facer possim assum. Lorem
- Buttons: Save, Undo, Toolbar, Status, Question Author.

Annotations:

- Structured guidance from Template:** Points to the 'Introduction (Template)' and 'Summary of Application (Template)' items in the tree.
- Guidance Tree structure:** Points to the entire tree structure.
- Integrity of review ensured by storing all information, processes and documentation together in one Case:** Points to the 'Detail' pane.

On-Demand Knowledge Management

The image shows a screenshot of a software application interface for knowledge management. The interface includes a sidebar with a tree view of documents, a main content area with a document preview, and a top navigation bar with tabs. Three purple callout boxes highlight specific features:

- Guidance Template tabs assist reviews**: Points to the 'Why Question' tab in the top navigation bar.
- Knowledge added during normal work process is preserved**: Points to the 'Tribal Wisdom' tab in the top navigation bar.
- Reviewer improvement of Safety Evaluation Report, Tribal Wisdom, Why Question, References are available for next Review Case**: Points to the 'References' tab in the top navigation bar.

The main content area displays a document titled "1 Conformance to Guidance" with the following text:

Ut wisi enim ad minim veniam, quis nostrud exerci tation ullamcorper suscipit lobortis nisl ut aliquip ex ea commodo consequat. Duis autem vel eum iriure dolor in hendrerit in vulputate velit esse molestie consequat, vel illum dolore eu feugiat nulla facilisis. At vero eos et accusam et justo duo dolores et ea rebum. Stet clita kasd gubergren, no sea takimata sanctus est Lorem ipsum dolor sit amet. Lorem ipsum dolor sit amet, consetetur sadipscing elitr, sed diam nonumy eirmod tempor invidunt ut labore et dolore magna aliquyam erat, sed diam voluptua. At vero eos et accusam et justo duo dolores et ea rebum. Stet clita kasd gubergren, no sea takimata sanctus est Lorem ipsum dolor sit amet. Lorem ipsum dolor sit amet, consetetur sadipscing elitr, At accusam aliquyam diam diam dolore dolores duo eirmod eos erat, et nonumy sed tempor et et invidunt justo labore Stet clita ea et gubergren, kasd magna no rebum. sanctus sea sed takimata ut vero voluptua. est Lorem ipsum dolor sit amet. Lorem ipsum dolor sit amet, consetetur sadipscing elitr, sed diam nonumy eirmod tempor invidunt ut laboreet dolore magna aliquyam erat.

Comments and Working Notes are preserved in context of the Review & Watson Analytics searchable

Comments and Working Notes are maintained in a hierarchy of comment and reply exchange

Review Structure

- References & Regulations
- Setpoint Methodology Topical Report
 - Introduction
 - Introduction (Template)
 - Previously Reviewed Applications
 - Referenced Documentation in the Licensing Basis
 - Regulator Basis
 - Regulatory Basis (Template)
 - Summary of Application
 - Summary of Application (Template)
 - Additional Purposes for Methodology
 - Conformance to Guidance
 - Define Setpoint Terminology
 - RIS 2006-17 Concerns on Operability of Instrument Channels
 - Setpoint Relationships
 - Uncertainties and Their Combination
 - Facility Setpoint List
 - Relationship Between Allowed Value and As-Left As-Found Tolerances
 - Setpoints for Procedural Actions
 - Technical Evaluation
 - Technical Evaluation (Template)

Comments

Subject	User	Comment
Documentation for method(s)...	ups1	The method(s) by which setpoints are calculated shall be documented.
RE: Documentation for method(s)...	dsh3	Documentation may include, as appropriate, the following:
RE: RE: Documentation for method(s)...	TPR@NRC.GOV	Periodic channel tests shall be performed at an appropriate interval.
RE: RE: RE: Documentation for method(s)...	ups1	my response
Was the appropriate corrective action...	ups1	Gary, the applicant's as-found test data indicates that the test data is consistent with the setpoint relationships.
RE: Was the appropriate corrective action...	gxy	The applicants validation does show they took appropriate actions.

Comment

Status: Green Subject: Documentation for method(s) setpoints are calculated

The method(s) by which setpoints are calculated shall be documented. The documentation may include, as appropriate, the following:

Collaboration Through Workflows

The screenshot displays a software interface for managing workflows. On the left, a 'Review Structure' pane lists various tasks, some with green checkmarks and others with question marks. A callout points to this list, stating: 'Workflows help manage collaboration, ex. Assistance, Assigning Reviews, etc.'

At the top, a 'Requests' dropdown menu is open, showing 'Request Assistance' and 'Request Review'. A callout points to this menu, stating: 'Role based Workflow tasks'.

On the right, a table titled 'My Work (6)' lists tasks assigned to the user. A callout points to the 'My Work (6)' tab, stating: 'Individual Tasks in "My Work" with email notification'.

Project ID	Task	Task Status	Assigned To	Task Due Date	Sent From
20160719-1431BW	Request Assistance	Awaiting Assistance Response	Sundquist, Ulf (ups1)	08/01/2016	Ghneim, Munira (msg)
20160719-1431BW	Request Review	Assigned to Reviewer	Sundquist, Ulf (ups1)	10/14/2016	Janum, Henrik (HXJ3)
20160719-1431BW	Request Assistance	Assigned to Reviewer	Sundquist, Ulf (ups1)	08/02/2016	Lobanov, Igor (ix1)
20160719-1431BW	Request Review	Assigned to Reviewer	Sundquist, Ulf (ups1)	09/22/2016	Janum, Henrik (HXJ3)
20160721-0416EN	Request Review	Assigned to Reviewer	Sundquist, Ulf (ups1)	09/30/2016	Janum, Henrik (HXJ3)
Docket 50-269, 270, 287	Request Assistance	Awaiting Assistance Response	Sundquist, Ulf (ups1)	09/02/2016	Young, Gary (gxy)

Custom RMS Watson Analytics Searches Document + IBM Cases

RMS Cases Collecti | IEEE Std. 603 | Search | Properties | Advanced Search | Page size 50

Facets Tree

- Case Id
- Case State
- Case Type
- Created By
- Created Date
- Current Version
- Document Class
- Last Modified By
- Last Modified Date
- Licensee
- Object Type
- Project Name
 - ☐ DEMO Babcock and Wilcox mPower,
 - ☐ Clarifications to Final Safety Evaluation
 - ☐ PILGRIM NUCLEAR POWER STATION
 - ☐ Flood Hazard (1)
- Question Tag
- Related Subject Matter
- Report Type
 - ☐ Setpoint Methodology DITA (8)
 - ☐ Flood Hazard Reevaluation DITA (1)

☐ New Search ☒ Add to Search

Search Clear

Page 1 of 1

Displaying 1 - 37 of 37

Custom Watson Analytics search of Review Cases and documents filed in Cases

Facets folders combine document content PLUS IBM Case properties to help find the right document and Case

All related information and Facets are in context of the Review Case, not just standalone documents – findings, comments, tribal wisdom, documents, reference, etc.

Custom RMS Advanced Search creates the complex search syntax for you

(50.54(f)) (@xmlf2::'<component tabTitle="Question">54.54(f)</component>')

Learning complex Watson query syntax is not required

The Advanced Search dialog creates the search syntax to limit a search to a subset of an XML document – only comments or only notes or another subsection

RMS Advanced Search dialog creates the complex search syntax for you

Custom RMS Watson Search Opens Review Case Tree to the Found Item

RMS Watson search opens the Review Case showing all related information and documents in Context of the Case

The screenshot displays the RMS Watson Review Case interface. On the left, a 'Review Structure' tree view is visible, listing various sections of the review. The 'Conformance to Guidance' item is highlighted in blue. On the right, a 'Preview' pane shows the content of the selected item, which is a document titled '1 Conformance to Guidance'. The document text is displayed in a serif font, with some words highlighted in red and green. A purple arrow points from the 'Conformance to Guidance' item in the tree view to the 'Preview' pane, indicating the flow of information from the search results to the document content.

Review Structure

- [-] Edit
- [+] Insert
- [X] Delete
- [+] Add Document
- [+] Add Reference
- [+] Requests
- [+] Review
- [+] Attached Documents
- [+] Properties
- [+] Tasks
- [+] History/Comments
- [+] Emails
- [+] Previous Reviews
- [+] References & Regulations
- [+] Setpoint Methodology
 - [+] Introduction
 - [+] Title
 - [+] Introduction (Template)
 - [+] Previously Reviewed Applications
 - [+] Referenced Documentation in the Licensing Basis
 - [+] Regulatory Basis
 - [+] Regulatory Basis (Template)
 - [+] Summary of Application
 - [+] Summary of Application (Template)
 - [+] Additional Purposes for Methodology
 - [+] Conformance to Guidance
 - [+] Define Setpoint Terminology
 - [+] Setpoint Relationships

Preview

1 Conformance to Guidance

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WCA Benefits

Safety Reviews

- Specific knowledge from previous Safety Reviews can be found and leveraged for a new Safety Review
 - Cataloging of work products is not required, nor practical
 - Cannot foresee every possible search criteria to catalog
- Found knowledge is shown in association with other related knowledge in a Case organized in a logical easy to navigate tree structure
- The result - Improved efficiency, consistency, reduced cost, and faster Safety Reviews by leveraging previous review knowledge

Event Research

- Events require identifying all Nuclear power plants with the same risk
- WCA can help find plants with the same risk faster and at a lower cost

Collaborative Authoring in Web & On-Line/Off-Line in MS-Word

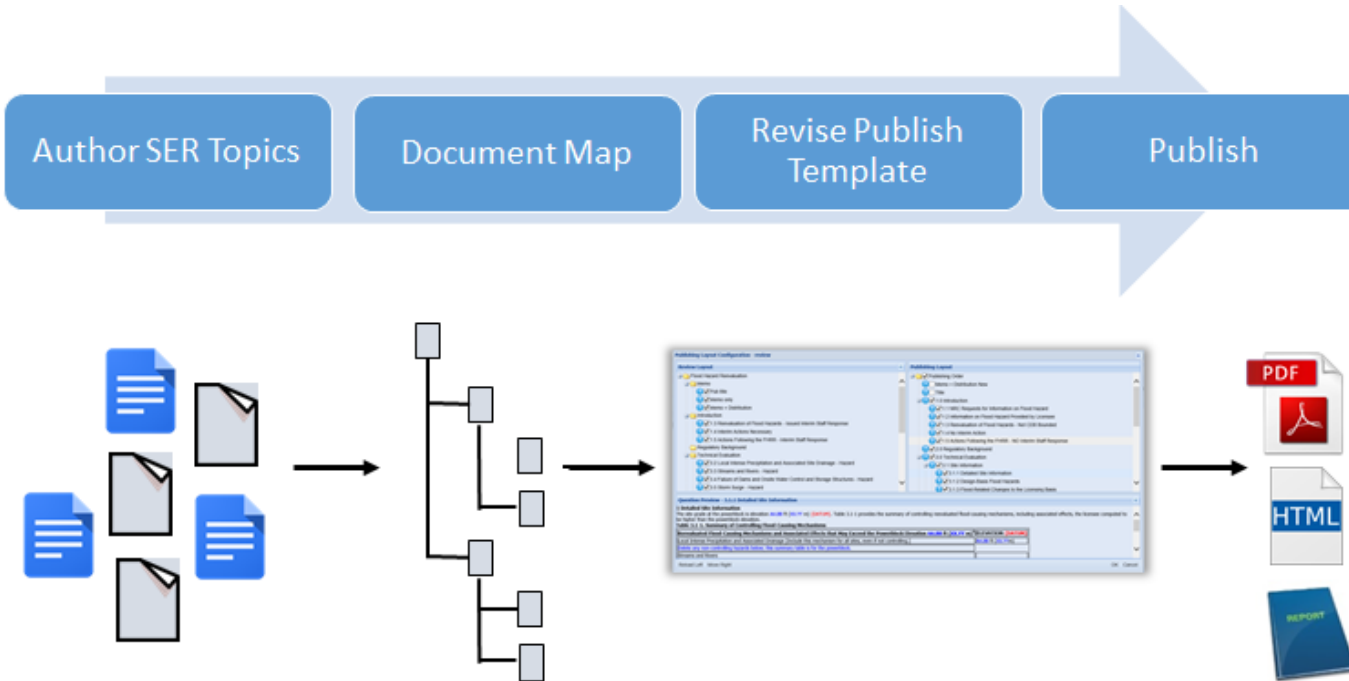
Concurrent authoring by multiple contributors

Author in MS-Word or in browser

Off-line edit by saving document locally

Save Off-line edit knows where to check-in document

DITA Document Authoring and Publishing



- **Enabling technology for Collaborative Authoring**
- **Review Case manages collection of Topic files that are combined for DITA publishing**
- **Promotes efficient, accurate re-use of standard content**
- **Allows author to focus on content, not formatting**

DITA Features

Collaborative Authoring

- Topic shown in read-only view for others when being edited
- Author focuses on content, not formatting
- Author in Web application, MS-Word both on-line and off-line
- Review folder of Topics in MS-Word, not just one Topic at a time
- MS-Word Topic knows where to save so everything remains in synch
- IBM Case maintains all Topic content in simply tree view structure

Publishing

- Authored Topics are automatically combined based on Publishing Layout
- Publishing Layout is separate from the review Tree view layout
- Publishing Layout shows the Review tree icons, what's included/excluded from the published content
- Include/exclude section heading by checking a check box
- Drag and drop hierarchy rennumbers headings and table of contents
- Publish to any format with click of button – PDF, Word, etc.

RMS Features

Custom WCA
ICM search
shows complex
relationships in
context of
Review Case

Progression of
review retained
in Case
supports staff
changes

Collaborative
Case Review by
many

DITA for
Collaborative
authoring of
findings

DITA enables
Authors to focus
on content, not
formatting

Dynamic
Template
structured
guidance for
consistent,
efficient Review

On-Demand
Knowledge
Management

Reference
library

Automatic real-
time statistics

Management
oversite of
Reviews

Collaborative role
based and team
review workflows



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[@IBMGovernment](https://twitter.com/IBMGovernment)