



Implementation of a Training Material Management System - Needs and Benefits

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Topics

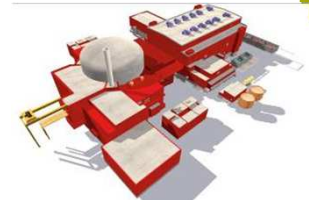


- ▶ **Training of NPP Personnel**
- ▶ **Challenge of Managing Training Material**
- ▶ **Benefits of Training Material Management Systems (TMM)**
- ▶ **Approach to TMM Development and Implementation**
- ▶ **TMM Project at AREVA Reactors Training Centre**
- ▶ **Conclusions**

Training of NPP Personnel

- ▶ **AREVA is a supplier of GEN III NPPs**
 - ◆ **EPR™ - a 1650+ MWe Pressurized Water Reactor – 4 Units under construction**
 - ◆ **ATMEA1™ – a 1100 MWe Pressurized Water Reactor – ready for bidding, contracting and licensing**
 - ◆ **KERENA™ - a 1250 MWe Boiling Water Reactor – final stage of basic design**

- ▶ **Providing additional services like training of NPP personnel, namely**
 - ◆ **project management personnel**
 - ◆ **engineering personnel**
 - ◆ **operating personnel**
 - ◆ **maintenance and technical support personnel**



Example: Training of Operating Personnel

- ▶ **Job and plant specific training, lasting for several years, with the goal of licensing the personnel in accordance with regulatory requirements**
- ▶ **Including classroom (theoretical) training, hands-on training, simulator training, on-the-job training**
- ▶ **Training content directly related to plant design documentation, e.g.**
 - ◆ **System descriptions**
 - ◆ **Instrumentation and Control task descriptions**
 - ◆ **Operating procedures**
- ▶ **After initial training, licensed operators have to participate continuously in requalification training**

Training Material for Training of NPP Personnel



- ▶ **Training material = trainees' manual plus instructor guides**
- ▶ **Trainees' manual = slides, textbook, exercises etc.**
- ▶ **Training material linked directly to the plant design data**
- ▶ **In case of operating personnel: huge amount of classroom training, up to 40 weeks plant specific training**
- ▶ **Total amount of training material for initial training in a new-build project: approximately**
 - ◆ **10.000 slides**
 - ◆ **13.000 text pages**
 - ◆ **1.500 "traditional" documents**



Why a Training Material Management System?



Consider

- ▶ the large amount of training material to be managed
- ▶ linking training material to other documentation important for NPP design, operation and maintenance

➤➤ Management of training material must be supported by an appropriate tool

Benefits of Training Material Management Systems



- ▶ **Excellent pedagogical quality by use of prescribed well-proven document structures and layout, supplemented by an editing guideline**
- ▶ **Re-use of existing material in different documents based on a single-source principle**
- ▶ **Easy management of versions and variants**
- ▶ **Well-controlled interfaces to other types of information, stored e.g. in plant design, operation or maintenance documents**
- ▶ **Documents may be created in a format that is independent of software vendor specific software packages**

Approach to TMM Development and Implementation



- ▶ **Information model**
- ▶ **Content module concept and re-usability**
- ▶ **Meta data concept**
- ▶ **Transfer concept**
- ▶ **Publication concept**
- ▶ **Decisions made by AREVA Reactors Training Centre**

Information Model

- ▶ An information model allows you to specify content within your documents according to its main purpose
 - ◆ For example, certain content may be considered as "headline", other as "abstract" and you are able to define other content as "example" and link it to the content "picture"
- ▶ Using XML for huge amounts of content requires the definition of an information model
 - ◆ Ensure that all documents are structured uniformly
- ▶ Several information models are already available and may be examined for use
 - ◆ DocBook, DITA,...

➤➤ **Define an adequate information model that supports the structure of training documents and your goals for material re-use**

Content Module Concept

- ▶ A content module defines which parts of the information model form a piece of content that may be successfully re-used
 - ◆ **A content module comprehends information linked to the training process that is self explanatory and needs no further information to be understood by learners**
 - ◆ **A content module could be set up for the following content types defined in the information model:**
 - Learning objective
 - Headline
 - All written content referring to learning objective
 - Picture
 - links
- ▶ This content module concept is the basis for re-use of material
 - ◆ **Granular modules are easy to re-use but difficult to manage**
 - ◆ **Big modules are easy to manage but difficult to re-use**
- ▶ Re-usability requires a concept adapted to the company's strategy

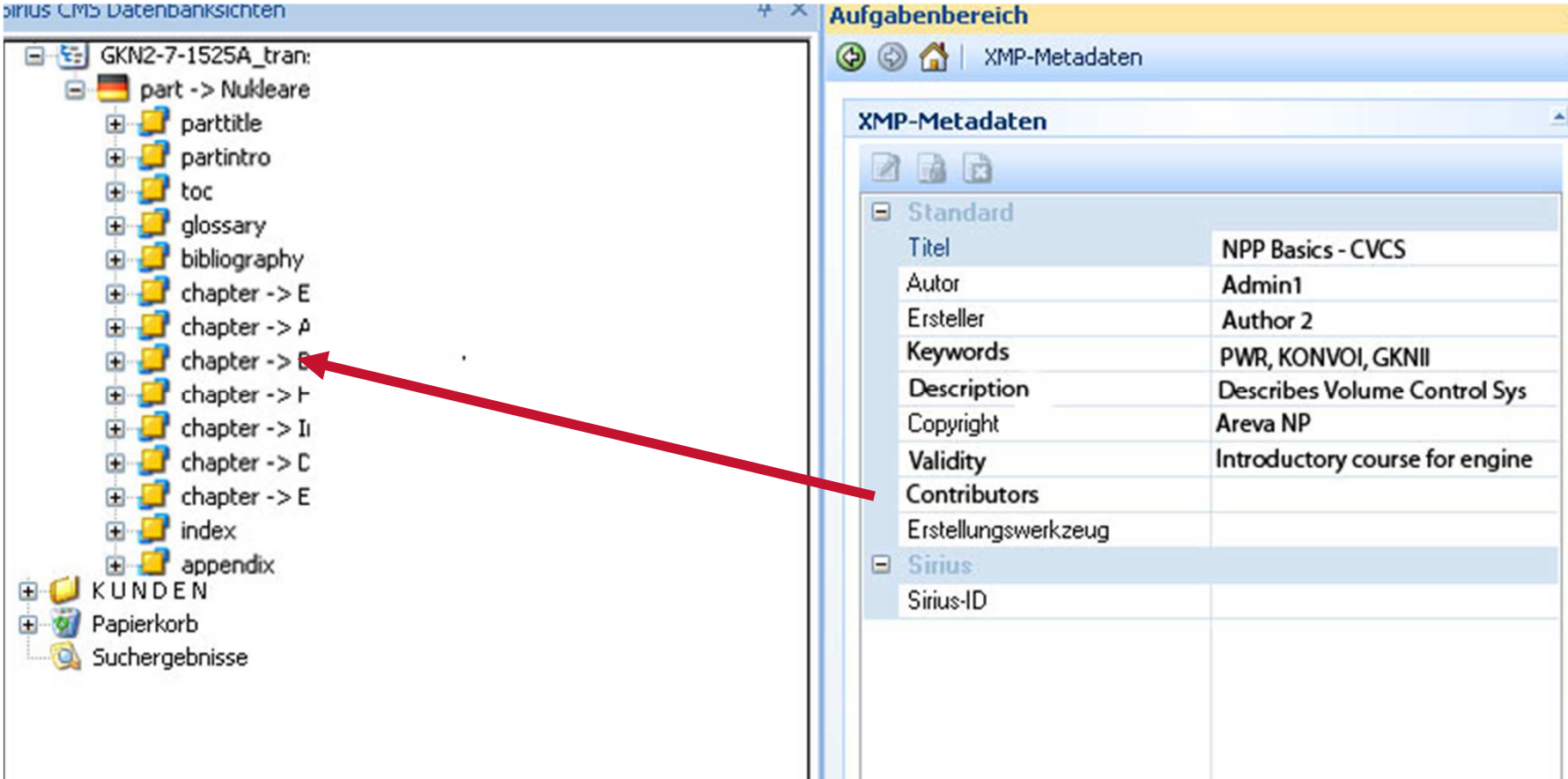
Meta Data Concept

- ▶ Meta data is information about the content managed within the content management system
 - ◆ **Meta data supports efficient management of information within a content management system by describing documents, content and content modules**
 - ◆ **Meta data enables users to search, categorize, and efficiently use information**

▶▶ **An adequate meta data concept must be defined that describes all content stored and managed**

- ▶ Meta data may also comprehend semantical information about content
 - ◆ **Explanation, for what type of training scenario a content module may be used**
 - ◆ **Which content modules may be linked to the present one to form a lesson**

Example: Meta Data



The screenshot shows the Sirius CMS interface. On the left, a tree view displays the structure of a document titled 'GKN2-7-1525A_tran'. The tree includes a 'part -> Nukleare' folder containing sub-folders like 'parttitle', 'partintro', 'toc', 'glossary', 'bibliography', and several 'chapter ->' items. A red arrow points from the 'chapter -> E' item in the tree to the 'Standard' metadata section on the right. The 'Aufgabenbereich' (Task Area) at the top right is labeled 'XMP-Metadaten'. The 'XMP-Metadaten' window displays a table of metadata for the selected item.

Standard	
Titel	NPP Basics - CVCS
Autor	Admin1
Ersteller	Author 2
Keywords	PWR, KONVOI, GKNII
Description	Describes Volume Control Sys
Copyright	Areva NP
Validity	Introductory course for engine
Contributors	
Erstellungswerkzeug	
Sirius	
Sirius-ID	

Meta data

- ▶ inform about content modules
- ▶ support search for content modules

Transfer Concept

- ▶ The transfer concept describes how the existing training material can form the basis for the future training material management system using XML
 - ◆ **The transfer concept should propose processes describing how existing material could be transferred to the XML database**
- ▶ Existing content must match the information model
 - ◆ **The more the information model differs from existing document structures, the more existing material must be re-modeled before being transferred**

➤➤ **A transfer concept describes how existing data can be transferred to XML and which adaptations must be applied to the material before the transfer**

Publication Concept



- ▶ XML based content may be publicized in several document types
 - ◆ **AREVA Reactors Training Centre targets: PDF, PowerPoint, RTF, HTML**
- ▶ Each document type requires a definition, how content should be displayed in this format
 - ◆ **Style sheets and XLS-documents must be defined**
- ▶ To ensure the efficient use of the system after implementation, the decision which document types are targeted and which content is required to form the targeted documents must be taken in the system design phase

Decisions Made by AREVA Reactors Training Centre



- ▶ Existing training material is the basis for future XML-based content creation
 - ◆ Information model must match existing document structures
 - ◆ Content modules must adapt to existing structures
 - ◆ Transfer concept must be created
- ▶ High level of content re-use is targeted
 - ◆ Content modules must be rather granular
 - ◆ Meta-Data concept must comprehend semantic information about content
- ▶ Content is publicized mainly in the formats MS Word, MS PowerPoint and PDF
 - ◆ HTML also targeted to form Web Based Trainings and eventually EPSS with the content
- ▶ Authors should be able to create content in existing editors to avoid acceptance issues
 - ◆ MS PowerPoint, MS Word

EPSS = Electronic Performance Support Systems

Using Existing Editors for Content Creation



- ▶ **PowerPoint**
 - ◆ **Linked to TMM for content creation**
 - ◆ **Content publication and content creation**
 - ◆ **Content manipulation in PowerPoint affects the content modules the slide/ presentation is based on**
 - ◆ **Creation of pictures possible**
- ▶ **Word-Like XML editor (specifically developed for AREVA)**
 - ◆ **Linked to TMM for content creation**
 - ◆ **Use requires no XML-expertise**
 - ◆ **Is used to create Texts, Textbooks and Exams**
- ▶ **MS Visio and Adobe Illustrator**
 - ◆ **Linked to TMM for content creation**
 - ◆ **Use requires no XML expertise**
 - ◆ **Used to create graphical material that is publicized in PowerPoint and PDF**

Content Creation Solution



- ▶ Using MS-products for content creation is an AREVA Reactors Training Centre stand alone feature
 - ◆ **Development was realized between AREVA and a sub-contractor**
- ▶ This interface allows to stick to existing processes of content creation
 - ◆ **No extra costs in content creation expected**
- ▶ Interoperability of content still possible
 - ◆ **Pictures created in MS Visio may be edited in PowerPoint**
 - ◆ **Changes affect content module in database**
 - Version of content module created

Conclusions

➤➤ For the nuclear industry, high quality supportive training material must be provided, to be available during the whole lifecycle of a nuclear facility

➤➤ Training Material Management system based on XML ensures the fulfilment of most requirements from operators and suppliers of nuclear facilities

➤➤ Development and implementation of a TMM requires a deep analysis of existing document development processes and related roles, and a clear strategy for intended use

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