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Procedure/Event Based Implementation Of Abnormal/Emergency Tasks Hierarchy Using Vision Developer

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VISION Developer and VISION Learning Station are products of the FocusSM Learning Corporation

Introduction

This paper presents a Procedure/Event Based approach for the development and implementation of an abnormal and emergency operations task analysis hierarchy using the VISION Developer application.

Problem Statement

A reimplementaion of the VISION Developer application was conducted with emphasis on the Operations training program. The effort focused on system level tasks, system knowledge, and development of a program structure that reflected the actual qualification processes and hierarchy employed at the facility.

This project captured the AOP/EOP tasks as placeholders but due to other constraints, did not include development of the analysis beyond the major task level. This has created a challenge to content developers and instructional staff as specific actions were not clearly captured that could have an effect on the operators' ability to efficiently operate the plant under abnormal or accident conditions.

Previous Options

The original evolutions analysis branch presented only the high-level title of special and emergency operating procedures (referred to as SOP/EOP).

This limited the information available for use in the development of learning content for the cognitive, behavioral, and psychomotor aspects of the related activities.



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Proposed Solution

It is proposed to implement a procedure and event based approach for development of the SOP/EOP task hierarchies. This structure should be created within the EVOLUTIONS branch of the analysis hierarchy in VISION and would be linked to the appropriate cognitive and performance objectives (representing the learning content).

Identify Learning Points

The procedural approach ties each of the actions within the special or emergency procedures to the specific tasks and elements that are performed. This enables the developer to quickly identify the operational points that must be addressed in a performance based setting and the cognitive attributes associated with those points.

Actions & Reactions

The event based approach for developing the analysis considers not only the specific actions anticipated by basis documents (hence the flowchart) but the branches or possible outcomes occurring as results of observed symptoms (plant operating conditions).

Relational Learning Content

Consideration of both procedure based (process) and event based methods provides not only an accurate representation of the scope of the abnormal or emergency procedure, but also of the relationships between discrete operator actions and plant responses to learning content. This permits the development of content (cognitive or performance based) for **each** of the components allowing for rapid development of training units.

Implementation

Each AOP/EOP is represented by the "Function" type of component as each special or emergency procedure truly does represent an operational function. Beneath this level, the individual actions and "branches" are represented using other organizers. (The development of this hierarchy is completed in a DEVELOPMENT area within the target VISION project to prevent compromise of approved data objects.)

An event-process-chain (EPC) diagram is then sketched for the procedure under evaluation that is aligned with the procedure flowchart. This allows for the classification of the components into "Phases" (a collection of tasks performed to achieve an outcome), "Tasks" with specific entry criteria and possible operating results, and "Elements" that identify the events — based on symptoms and outcomes — encompassed by each task.

The taxonomy for the User Defined Identifiers represents the procedure (EOPRPV), the major block or level (L2), the relative position of an action within the block (A, B, C...), and the preferential sequence (".01", ".02", etc.).



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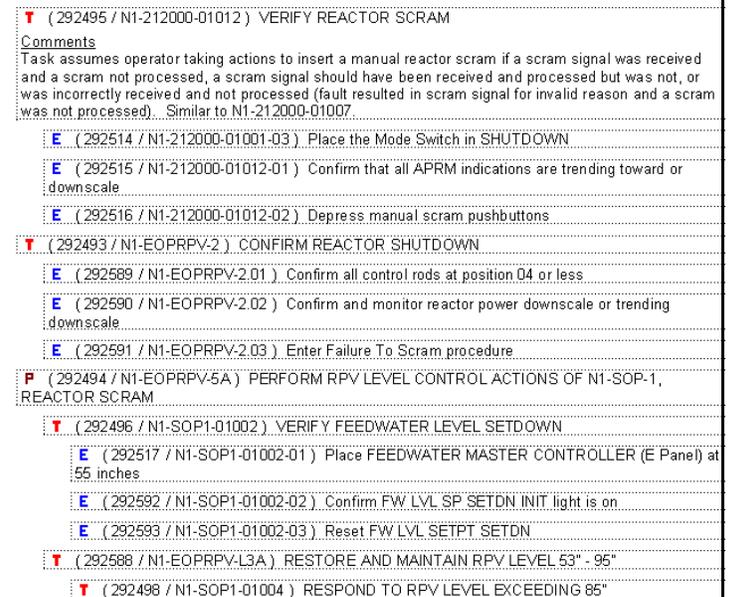
Example

In the example below, a segment of the RPV Control Emergency Operating Procedure for a BWR is presented using the proposed approach. Note that the arrangement of organizers does not represent prioritization despite the vertical presentation.



In this model the "Phase" organizer represents the beginning point for the RPV LEVEL portion of the EOP (in reality, all legs of an EOP are entered concurrently) while the tasks represent discrete operating results or potential major nodes (resulting in branching to another procedure) and the elements the actions that must be completed or evaluated before progressing to the next major transition point.

The graphic below presents one possible output that could be used in the development of scenarios to exercise the various actions required to implement the procedure. Another potential use is as a "checklist" during either training or evaluations in the performance setting based on the direction that a simulation was driven. This approach helps to facilitate Scenario Based Learning (SBL), proven to be the most effective experiential learning methodology.



Summary

The Procedure/Event Based model for capturing the actions required to implement abnormal and emergency procedures or other evolutions represents an innovative yet logical approach to the analysis of training need, development of learning content, and support of continued Operations performance improvement.

For additional information regarding this approach or assistance in extracting greater value from training processes, please contact us.