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RTAP Evaluation Process for the
U-AVLIS Supervisory System

Scott Elko

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Lawrence
Livermore
National
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RTAP Evaluation Process for the U-AVLIS Supervisory System

The information contained within this document describe a set of proposed designs for evaluating the RTAP supervisory control and data acquisition software. The basis of this evaluation is two-fold: 1) to investigate the feasibility of integrating the components of the U-AVLIS supervisory system into RTAP and 2) to investigate the distributed capabilities of the RTAP system.

The evaluation process will be performed in an off-line development area (not in B490) and will concentrate its effort on integrating an unclassified subset of the existing U-AVLIS subsets into RTAP. These subsets will include portions of the Heater Control and Dye Combination Wall sub-systems. For the purpose of this evaluation, both of these subsets will constitute an RTAP environment and will operate remotely from one another. Moreover, it is the intention of this evaluating process to investigate the feasibility of preserving the existing SOM screens and to investigate the ability to retain some of the existing real-time trending capabilities which RTAP does not support.

This document contains the proposed implementation designs to support each of the sub-systems. They include a conceptual diagram and a description of the identifiable tasks, requirements, and issues regarding their implementation. This information provides a high-level overview and should not be construed as an all inclusive list. With the exception of starting a real-time RTAP trend from a SOM screen, the level of risk for each of the designs are low. This level of risk could be derived because several of the tasks involve peer-to-peer communication techniques that have been previously implemented and tested. However, more research into the area of starting a real-time trend from a SOM screen needs to be further investigated before a level of risk can be determined.

If the proposed designs are accepted, the information contained within this document will become the basis for deriving the required level of effort for the RTAP evaluation process.

Proposed Design for the RTAP Heater Control Environment

Tasks:

- Connect the Allen Bradley PLC hardware to the HP 715
- Configure the Allen Bradley scan task into the RTAP environment
- Configure the RTAP database
- Configure the RTAP scheduler
- Develop the RTAP/SOM Interface
- Modify the SOM to conform to the proposed design
- Develop an RTAP schematic for the Heater Control screen
- Evaluate RTAP Trending capabilities (real-time and historical)

Requirements:

- The SOM must convert data to the HP format before sending data to the RTAP/SOM Interface
- The RTAP/SOM Interface must convert data to the VAX format before sending data to the SOM
- The RTAP/SOM Interface must contain a mapping between the current point names and the new RTAP point names

- The RTAP/SOM Interface must convert between the two message formats (i.e., RTAP messages to/from SOM messages)
- The RTAP Heater Control Environment must be running before the SOM can establish a connection with the RTAP/SOM Interface

Issues:

- How do we connect the Allen Bradley PLC hardware to the HP 715?
- Will the scan task perform all the necessary functionality or do we need to extend it?
- How can we initiate and display a real-time RTAP trend from our SOM?
- The HP 715 contains only a runtime and configuration license. Therefore, any program development that interfaces with RTAP must be developed on the HP 735.

Proposed Design for the RTAP Dye Combination Wall Environment

Tasks:

- Configure the RTAP database
- Configure the RTAP scheduler
- Develop the RTAP/SOM Interface
- Modify the SOM to conform to the proposed design
- Incorporate the necessary C routines within the ODC FEP Server to communicate with the RTAP/ODC Interface
- Develop the Ada pragmas for the C interface routines that will reside within the ODC FEP Server

- Derive the format of the network messages between the ODC FEP Server and the RTAP/ODC Interface
- Develop the RTAP/ODC Interface

Requirements:

- The SOM must convert data to the HP format before sending data to the RTAP/SOM Interface
- The RTAP/SOM Interface must convert data to the VAX format before sending data to the SOM
- The RTAP/SOM Interface must contain a mapping between the current point names and the new RTAP point names
- The RTAP/SOM Interface must convert between the two message formats (*i.e.*, RTAP messages to/from SOM messages)
- The ODC FEP Server must convert data to the HP format before sending data to the RTAP/ODC Interface
- The RTAP/ODC Interface must convert data to the VAX format before sending data to the ODC FEP Server
- The RTAP/ODC Interface must contain a mapping between the current point names and the new RTAP point names
- Either the RTAP/ODC Interface or the ODC FEP Server must convert between the two message formats (*i.e.*, RTAP messages to/from ODC messages)

Issues:

- How can we initiate and display a real-time RTAP trend from our SOM?

Proposed Design for Communicating Between RTAP Environments

Tasks:

- Develop the HC_DB/DCW_DB Interface

Requirements:

- Each database must contain points for data that will be shared between environments
- The HC_DB RTAP environment must be running before the DCW_DB RTAP environment is started

Issues:

- This design was implemented because it *"appears"* that points within one environment cannot be dependent upon points in another environment (i.e., a local point's CE attribute can not be dependent upon a remote point). Is this actually the case?
- What form of time delays can be expected for communicating between environments? Will this be acceptable?
- Can an RTAP schematic contain data from both environments?
- Can an RTAP schematic operate on a separate node from the environment?

Note:

- Though the interface between environments could reside on either system, it was chosen to reside on the faster HP 735

Initiating and Displaying an RTAP Real-Time Trend from a SOM Screen

The following diagram depicts one possible solution for initiating and displaying an RTAP real-time trend from a SOM screen. One of the objectives of this evaluation process is to investigate the ability to retain some of the existing trending capabilities that RTAP does not provide. One such example is the ability to select points (max of 4) from a SOM screen and request a real-time trend. RTAP requires that a configuration file exist before a trend can be performed. Additional research into this area needs to be performed before the associated tasks for accomplishing this objective can be identified.

Overall Conceptual Design for the Evaluation Process (Excluding the Trender Interface)

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