Once the criticality of each item is established those with a ‘high’ or ‘medium’ rating are reviewed with the Management and Control Tasks Decision Process and suitable systems to protect against the risk and/or consequences are specified and recorded.

The series of questions lead you to sound and logical conclusions that are appropriate for the risk identified and for your business to commit to honorably fulfill. Each question progressively takes you through a more demanding management requirement.

Is the evidence of failure detectable?

Is the failure evident to the operator in their normal course of duties? If it is not easily detectable by the operator doing their regular rounds, or it cannot be made easily detectable, it is considered a hidden failure. Hidden failures are identified by using functional tests in which an item of plant or equipment is intentionally tested and its performance checked against its specification requirements.

For those failures detectable by operator inspection, a ‘watch keeping’ check and record sheet is developed. The operators regularly perform the observations and records what they notice. They fill-in the sheet and also double check and review it for signs of changed conditions indicating failure or soon-to-be failure.

An example of a simple weekly watch keeping check sheet for a tank farm facility used by the operators is shown in Figure 6.

WEEKLY TANK TERMINAL INSPECTION CHECK

TANK	NO VALVE LEAKS	NO PUMP SEAL LEAKS	PUMP OIL LEVEL OK	BY-PASSES CORRECT	BLANKS IN PLACE	VALVES CLOSED & LOCKED	SCRUBBER WATER DRUM LEVEL FULL	COMMENTS
NORTH TERMINAL								
N1								
N2								
N3								
N4								
N5								
N8								
N9								
NORTH MANIFOLD								
DATE:			SIGNED					

Figure 6: Sample ‘Watch Keeping’ Operator Inspection and Fault Identification Check Sheet.

10.Example – Domestic Hot Water System

As an example of applying equipment criticality analysis to a process system consider a domestic hot water supply. Start with a complete flow diagram of the system showing all its components and interactions.

A simplified sketch of a household electric hot water storage system is shown below in Figure 11.

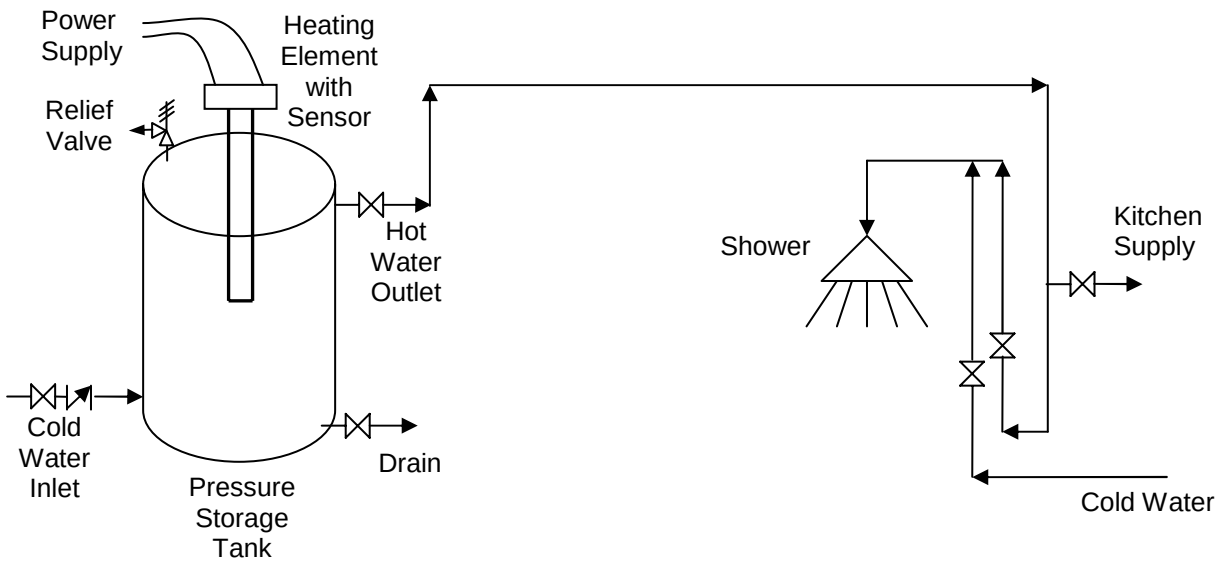

Figure 11: Simplified Flow Diagram of a Electric Domestic Hot Water System

We now consider which risk assessment technique to apply to determine the equipment criticality. Had the hot water system been on an off-shore oil platform where fire hazards are a major concern, it would be justifiable to conduct a thorough QRA using real failure data.

QRA failure date could be reliably found for the storage tank, the relief valve, the manual valves, piping and the electric heating element by talking to industry experts and by looking up suitable off-shore equipment reliability data bases.