Competence and Commitment report – past examples

Section Aii

Example 1

I work with other discipline engineers including civil, mechanical, electrical, and hydraulic. Together we produce outline designs, process and instrumentation diagrams, control philosophies and commissioning plans.

An example of where team work was critical was for a wastewater project at XXXX. The brief was to ensure the works could meet a new final discharge consent for ammonia. The site already had an activated sludge plant and nitrifying trickling filters.

I investigated the site performance from sample data and calculated the theoretical ammonia removal rates for each process unit using design calculations. I found that these processes should be able to achieve the new ammonia consent but both processes were under performing.

As a design team we visited the site and spoke to the operators. It was important to understand how the processes were being operated and maintained and to check that the drawings and data I had were accurate.

Together we identified several problems including:

- **Lack of maintenance of instruments**
- **Incorrect process control set points**
- **Mechanical problems with drive units**

We held a meeting with operations and maintenance personnel to present our findings. They agreed to work on the issues we identified and over several months I monitored the performance of the processes which improved.

I designed further improvements including replacement and additional instruments and improved process monitoring and control.

Through collaborative working with both the design team and other stakeholders we were able to make substantial savings on the project by optimising existing assets, rather than adding on new processes.

Example 2

When working for an EPC contractor as a process engineer, I was assigned responsibilities for flow assurance design as part of the front end engineering development (FEED) for a gas field project (offshore Egypt). Due to the multi-disciplinary nature of flow assurance, I was part of the wider offshore project team and also liaised extensively with the onshore project team. I worked with the client facilities manager (to optimize pipeline size requirements and cost implications), process engineer (reconcile gas demand requirements) and the subsea controls engineer (on the selection of hydrate inhibitor dosing units). On the contractor team, I engaged the subsea equipment engineer (to determine the consequence of the subsea manifold configuration), the materials engineer (to establish design limits of materials), the field development engineer (regarding the state of the reservoir) and the pipeline engineer (to agree on the pipeline route and configuration). Throughout, I kept the different disciplines informed of progress through regular presentations and reports.

When working for an IOC (International oil company) at one of the UK's largest refineries, I was responsible for executing the front-end development of a major (£14M) project to produce, store and export bitumen. I managed the conceptual design of the storage facility. Here, I combined contributions from a civil engineer (for siting of tanks), supply analysts (for market forecasts and ship parcel sizes), marine officers (for export jetty constraints) and a cost estimator to optimize the number and size of the storage tanks. I also led several workshops (opportunity framing and risks) with participation from commercial and technical personnel in order to promote understanding between the disciplines.

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Example 3	Following a safety incident, I recently led a project to carry out Safety Integrity Level (SIL) assessments on critical safety systems on site. Following an initial review and quick assessment with a group of senior managers (The engineering director, production engineering manager, site maintenance manager, EHS Manager, a senior project manager and myself), I led the SIL assessments by utilising staff with knowledge of the critical safety systems. These involved planning, co-ordinating and educating multiple groups. Some of the systems were:- nitrogen system, xray machine, electrical potential testers). I trained all staff required to help me with the assessments on the site procedure and key aspects of BS EN 61508/11 required. I set up various sessions for carrying out the SIL assessments. For the electrical system, I had the site electrical engineer, a couple of electrical techinicians) and myself as the safety engineer and as the lead. For the nitrogen system, I had a production engineering manager, a production engineer, an automation engineer and myself.
Example 4	■ While completing process design activities for a new production suite, I had to manage the expectations of the operational team for a reduced batch cycle time with the requirements of the regulatory team to comply with a very detailed production licence which was so specific that it appeared to limit the possibilities for efficiency improvement. I brought together key experts from the process technology, quality, R&D and regulatory teams in order to identify potentials for batch time reduction. Through breaking down the steps required to physically manufacture good product - rather than the details that were registered with the regulatory authorities - we identified that we could combine some stages of the manufacturing process and reduce mixing times for certain other stages based on justification that the homogenisation capability of the new equipment had an improved mixing effect vs. the previous plant that registration data was based on. The result was a process with a batch time of 40% of that previously required for the same volume of product. ■ I was asked to work towards solution of a consistent quality failure on a powder sachet filling line. I brought together the key stakeholders and process experts to work through the problem using a systematic approach (HACCP). The co-ordinated approach allowed the various peoples involved (engineers, packaging suppliers, process technologists, and quality managers) to gain a greater understanding of both the extent of the problem and the intricacies of the machinery and components involved, and drew out the knowledge of the maintenance engineers and process operators. This then allowed the team to come up with a series of proposed investigative steps, following which a new series of "best run settings" were created and successfully implemented by the production team. ■ I worked with electrical and control engineers to compile a functional design specification for a replacement batch control system for existing plant. The process included a saponification reaction that very few people had understanding of, and the basis of the existing control philosophy was unknown. I took information from experienced process operators and discussed details with the process chemistry expert (based overseas), and used this to define the critical temperature limits and actions for the software and hardware safety systems for the reaction vessel.

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