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| **Training and competency** | Training wasn’t provided for this job and developed skill proficiency and fluency?  The competency of performing this task wasn’t verified in the field.  For tasks rarely performed there wasn’t an opportunity to practice (dry run, simulate)  There wasn’t regular feedback provided on how well the person was performing the task. | A competency management system is in place describing how training and competence assurance is managed across different roles and levels  Competency management isn’t aligned and synchronised with procedures.  Training content isn’t determined based on need analysis and understanding challenges workers face (work as done)  Training and competence arrangements don’t consider skill decay and refresher training for key safety critical tasks that are performed infrequently.  Training and competence records aren’t monitored and accurately maintained.  Training and competence of third parties who undertake safety critical tasks isn’t managed to at least the same standard through contractor management systems such as tender evaluation and audit.  Training and competence considerations aren’t integrated into management of change processes  Training and competence management arrangements aren’t updated appropriately in response to accident and near miss investigations.  There isn’t process of audit and review of the effectiveness and efficiency of the competence management system. | Operators performing the task  Engineers supporting the task and their competency  Competency management system manager or equivalent  HR person responsible for recruitment and selection – talk about recruitment criteria  If the training is provided 3rd party, talk to the person responsible for training selection and the company who delivers the training | Review competence systems, training and assessment records  Test if the training content matches the needs of the job  Explore how the training effectiveness is evaluated and what is the refresher frequency.  Records of individual’s physical fitness/ capability for the task  Test how the desired skills were assessed during the recruitment / selection process  If training is provided by 3d party, explore how the training is selected, based on what criteria, how is it aligned with the competency management system |  |
| **Resources: Time, Tooling, Equipment, and workstation design** | * The person felt there wasn’t enough time available to complete the job * Person didn’t have all the information they need at the time to complete all the steps * There weren’t enough people to complete the job * Right tools / equipment (in good working order) weren’t available and used * Ergonomics design of tools didn’t apply industry standards (see ergonomics standards file) * It is not easy to access and operate equipment and its controls comfortably * The dimensions and layout of the workstation and the work area did not allow for comfortable completion of the task and good body posture * When interacting with the tool / equipment   + Things didn't work the way they expected   + Different things (valves, buttons, gauges) were too similar   + Things were hard to see   + Things didn't work well together   + Things were hard to handle   + Things took too long to respond | Procurement / purchasing processes did not involve the end-users in defining requirements  Product / purchase requirements did not match what workers needed in their context  People responsible for purchasing / hiring tools and equipment didn’t understand what workers need and their operational challenges  Human factors and human-centred design philosophy wasn’t integrated into product development (see HF engineering NOPSEMA file).  Engineers can’t demonstrate understanding and use of HF industry standards.  There was no a feedback loop between the users of tools/equipment and what makes the use difficult and the designers and manufacturers to allow for continual improvement. | People who use the tool / equipment  People who wrote and introduced rules / procedures for the use of equipment or work areas (e.g. what is forbidden in the yard)  People responsible for design, manufacturing and assembly  People responsible for determining equipment selection criteria and purchasing  People who develop engineering requirements / standards and processes  Suppliers who provide tools / equipment in use | Critically evaluate how design influences behaviour and increases likelihood of mistakes  Consider short-term and long-term perspective. You may not be able to change the pump today, but your feedback can help designers to create better pumps in the future. | Human factors in engineering and design NOPSEMA  Ergonomics standards for hand tools design  Spotting the design error traps and finding solutions - book of examples  ISO 6385 2016(en) Ergonomics principles in the design of work systems  <http://bit.ly/2O7ss3w>  ISO 9241-210 2010 Ergonomics of human-system interaction - Part 210 Human-centred design for interactive systems  <http://bit.ly/2O0BDmt>  Standard Practice for Human Engineering Design for Marine Systems, Equipment and facilities ASTM F1166 - 2007  <http://bit.ly/2O3P7h9> |