



**OHS in the Design Process: A Tool for OHS Professionals**

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**Health and Safety in Design**

Core Body of Knowledge for the
Generalist OHS Professional

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34.3

Access *OHS BoK* Health and Safety in Design at <https://www.ohsbok.org.au/chapter-34-3-health-and-safety-in-design/>

# OHS in the Design Process – A Tool for OHS Professionals

These questions and responses were generated through workshop discussion by the panel of expert advisors that supported the development of the *OHS BoK* chapter 34.3 Health and Safety in Design. Questions and matters for consideration have been enhanced through reference to Read (2015) and Plattner (2017).

Use of the checklist should be informed by knowledge of the content of *OHS BoK* chapter 34.3 Health and Safety in Design.

The checklist has been provided in MS Word format to enable customisation to the user’s context including industry and organisation. Where the checklist is modified, the source document should be acknowledged.

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| **Questions the OHS professional might ask or consider?**  | **Follow-up questions, matters for consideration**  |
| --- | --- |
| **1 Design team**  |  |
| Who should be on the design team?  | Have we got the skills required? (Technical skills as well as attributes such as collaborative skills, creative and integrative thinking, being open to and valuing range of input.) What discipline, knowledge and attributes are required for the core of the team and what other advice might be required?Are end users, stakeholders and subject matter experts represented?Is a design ‘champion’ required? |
| Who should facilitate the design team? | Should have appropriate skills to:* Focus on process rather than content
* Encourage and support collaboration and engagement
* Keep process on track.
 |
| **2 Design process**  |  |
| Have the design governance processes been clarified? | Approval (What is required for signoff? Who signs off? Do they have the required knowledge?)What processes will be applied to manage changes to the design? What communication and consultation processes will be in place? Are all stakeholders included in the communication and consultation processes?  |
| Does the design process allow for user consultation, including modelling, prototyping and testing?  | What attributes of the user group need to be considered to ensure the consultation is effective?What modelling processes best suit the design and the user group?  |
| **3 Concept development**  |  |
| **3.1 Context**  |  |
| Why is this project being undertaken? | Is it in response to OHS concerns, an incident, risk assessment, customer response, economic, routine renewal …? |
| What is the purpose of the design? | What is the designed product required to do?Are there any performance criteria for the designed product? |
| What is the scope of the design process? | How much will be specified in the design? What might be left to commissioning/implementation? What are the OHS implications of leaving some decisions to later stages in the design process? |
| What is the intended life for the design output?  | What might the life depend on? How long could the design be in use? What factors might limit/extend its life? |
| Are there any strategic factors that should be considered in the design? | How does the design fit with the strategic direction of the organisation?How might the workplace, technology, workforce change over time?How might the use of the design change over time?  |
| Are there any financial limitations, parameters set for the project? | While financial factors should not override safety, the OHS professional should be aware of any stated financial parameters. |
| Are there other organisational constraints that may impact the design or implementation of the design?  | Constraints may relate to industrial relations, HR, company values, moral or cultural constraints, deadlines or schedules, etc. |
| Are there any assumptions underpinning the process? | Assumptions may be stated or unstated. What unstated assumptions may exist that need to be clarified?  |
| **3.2 Users and others**  |  |
| Who will interact with the output of the design over its life cycle? (construction/manufacture, install, commissioning, operating, cleaning, maintaining, decommissioning, dismantling, disposal) | What are the abilities of the user groups? Will they require new knowledge and skills?What are the physical characteristics of the user groups? (see anthropometry)How will the design consider current and future variation in these groups?  |
| What are the access, maintainability and usability requirements?  | Where will the design be located? What is the surrounding environment – physical obstacles, lighting, exposure to weather? Can operators access the area and the required controls? Will maintenance be conducted in situ or is there a policy of rotable change out? How are maintainable items removed, what is the sequence of removal, are risks associated with the removal process (taking grid mesh out, removing handrails or lifting over work areas)? Have tooling lay-down areas, mobile equipment access and frequency of access been considered? |
| In addition to the users, who are the other stakeholders in the design? | Technical advisors? Production manager? Finance? Marketing? Workers who are not direct users? Customers? Suppliers? Community? |
| **3.3 Research**  |  |
| What information is available internally and externally on functionality, OHS and environmental impacts?  | Sources of information may include regulators, legal case history, hazard alerts, industry bodies, specialist advisors, and informal and formal networks.  |
| What legislation or standards may impact the design? | WHS legislation? Other technical or industrial legislation? AS/NZS and ISO standards? Industry standards? |
| What hazards are associated with the design? How might these hazards impact health and safety of the users and others who interact with the design?  | Have the hazard identification and risk assessments considered all stages of the life cycle of the designed product?Have the hazard identification and risk assessments considered users in the broadest sense?Have the hazard identification and risk assessments been reviewed with any changes to the design?  |
| What ergonomic or engineering principles or technical specifications may impact the design?  | Is there a need to consult with an ergonomist or engineer? What sort of specialist engineering, ergonomic or other skills/knowledge are required?  |
| What are the likely environmental impacts from the manufacture/construction, commissioning, operating, cleaning, maintaining, decommissioning, dismantling or disposal? | Is environmental, occupational hygiene or occupational health expertise required?  |
| **3.4 Analysis**  |  |
| In what physical, psychosocial and organisational environment will the design be used?  | Is organisational psychology expertise required?  |
| What are the ‘system’ components within which the design will be developed and implemented?  | System components may include organisational priorities, management and supervisory structures, HR and industrial relations environment, dependence on and integration with other work processes and work practices.  |
| How will the design be used?  | PETE (people, equipment, tasks and environment) analysis for each user at each stage: **P**EOPLE likely to use and/or be in the area (workers, operators, maintenance, cleaners, contractors)**E**QUIPMENT that will be used in association with the design**T**ASKS that will be undertaken using the design or in the area of the design**E**NVIRONMENT in which the design will be used, including environmental stressors such as heat/cold, weather, chemicals, ‘wear and tear.’ |
| **3.4.1 Design for construction and manufacture**  |  |
| How will the design be manufactured/constructed? | e.g. off site, on ground / above ground?Who will undertake the manufacture/construction? In-house/contractor? Skills required? Supervision?  |
| What are the decisions required as part of the manufacture/ construction? | What will be the critical control points in the construction? |
| What hazards might be encountered during construction/manufacture? | How will these hazards be addressed?Are Safe Work Method Statements (SWMS) required? |
| How might the organisation of the work impact the construction and safety aspects? | What overlaps might occur in scheduling trades? What might be the impact if there are delays in some stages of the construction?  |
| How adaptable is the construction methodology to address unforeseen developments?  | How might delays, cost-overruns, supply delays or other contingencies impact the integrity of the design? Will current SWMS require revision?Will additional skills be required? |
| What might be the impact of modification in design?  | Who might be affected by the modifications? Consider those constructing or manufacturing the designed product, those who commission operation of the product, those who maintain or clean the product, operational users, those who may decommission or dispose of the product as well as functions such as procurement and training. In what ways might these groups be impacted? |
| **3.4.2 Design for supply/install** |  |
| What criteria will be specified for procurement of designed item or parts? | Are there relevant standards that should be considered?Have the criteria been tested?What flexibility will be allowed in meeting the criteria? Is there any additional risk? |
| **3.4.3 Design for commissioning** |  |
| Are processes in place to verify that the product is built as designed?  | What arrangements will be required for inspection and testing against the design? |
| How will the installation/ commissioning be staged? | PETE review for each stage of installation? (walk the lines or step through the process) What risk assessments are required for each scenario/stage of commissioning? What procedures might need to be developed? |
| What testing might be required at each stage? |
| What simulations/scenarios might be tested?  |
| What could go wrong?  | What could go wrong during commissioning? If something does go wrong, how will a quick shut down work? What precautions should be taken during testing to minimise risk associated with any failures during testing? |
| **3.4.4 Design for use** |  |
| PETE review  | P – skilled operators E – reliability, running time, operating envelopesT – parameters for use (when properly used), potential for variations in use, other purposing, instructions, procedures E – suitability for/of the environment intended for use. |
| Is it fit for purpose? | Have appropriate risk assessments been conducted taking account of the complexity of the design, the hazards and level of risk? Does it meet operational requirements, including allowing for variability in inputs as well as use?Does it meet performance requirements? |
| What record keeping is required? | Procedures, operational hours or conditions?  |
| What are the energy demands of the design?  | Are there modifications that could conserve energy?  |
| What sustainability issues might be associated with the design? | Supply of raw materials? |
| **3.4.5 Design for maintenance**  |  |
| What will be the maintenance requirements?  | Is maintenance required, how often, by whom?Will maintenance be undertaken in a workshop or on site?What access will be required for maintenance?What requirements might there be to replace parts?Is there a policy of rotable changeover of parts?  |
| Is isolation required for maintenance?  | What energies will be present and require isolation?Can the energies be reliably isolated and/or discharged?What isolation procedures will be applied? Physical lock out / procedural tag out? Reliability?  |
| PETE review | P – skills required for maintenance E – access equipment requiredT – frequency of maintenance, predictability of maintenance (programmed/breakdown) E – accessibility  |
| What record keeping will be required as part of maintenance? | Inspections? Checks? Service?  |
| **3.4.6 Design for de-commissioning/disposal** |  |
| PETE review  | P – skills required for decommissioning E – special equipment required for decommissioning T – how will parts be broken down? what raw materials might have accumulated? E – how/where will parts be disposed of?. |
| **4 Design approval**  |  |
| **4.1 Design evaluation**  |  |
| Has the design considered the full life cycle of the designed product? | Life cycle includes construction/manufacture, supply/install, commissioning, use, maintenance, decommissioning, disposal.  |
| Will the design work? What OHS issues might be associated with the design? (Design testing)  | User group meeting(s) to review schematic design with a focus on health and safety. Focus and questions will depend on the nature and purpose of design and user group.  |
|  | Are mock-ups, models or prototypes required to fully analyse functionality and potential OHS issues?  |
| What OHS issues associated with the design should have been identified through the design testing? | Check back with hazard identifications, risk assessments and other internal and external information.  |
| What design modifications are required to address OHS issues?  | While the OHS professional may make recommendations, it is not the role of the OHS professional to define the required design changes. There may be a number of ways to address the identified issue(s). These design modifications should be similarly subjected to design testing to ensure the identified issues have been addressed without introducing new hazards/issues.  |
| Has design testing identified the need for processes to support implementation of the design?  | Implementation support processes may include modification to the workplace, training, development of work procedures, and supervision.Is a communication strategy required?  |
| **4.2 Design brief**  |  |
| Have the design changes identified through design testing been included in the design? | What evidence is required to demonstrate inclusion to an appropriate standard?Is further consultation or testing required on the design modifications?  |
| Does the design brief clearly state design specifications and design description to ensure it is constructed as intended? | Design brief may include diagrams, photos, computer-generated models and screen shots of interfaces. |
| Have support processes required for implementation of design been documented and provision made?  | Appropriately skilled personnel? Time for orientation and training? Maintenance resources and scheduling? |
| Does the design and associated documentation clearly address identified OHS issues? | Would a safety-case approach be helpful/appropriate?  |
| Have the short-term OHS issues related to the construction and installation and any impact on others been identified and addressed in related documentation?  |  |
| Are any contractor requirements clearly defined? | Are OHS requirements addressed in the contractor documentation? Are OHS criteria a basis for contractor selection?Have the required skills been considered in contractor selection?  |
| Have any procurement specifications been clearly defined? |  |
| Have stakeholders had opportunity to review and provide input to final design? |  |
| Is OHS sign-off part of the approval process? | Who, and what level of authority, is appropriate for sign-off?  |
| **5 Verification**  |  |
| Has the design as implemented met the specifications in the project brief?  | Evaluation should address both short-term implementation as well as longer-term monitoring. May require accessing a range of views. |
| Have any unforeseen issues arisen relating to safety, health, usability or engineering integrity of the design? | Is it safe to use in its current form?How is it planned to address these issues?Is re-design required?  |
| **6 Reflection**  |  |
| What lessons have been learned through the design process? | What might be done better next time? |

**References**

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