

PROJECT PROFILE

Department of Defence / Decmil HMAS Stirling Remediation Project Defence Fuel Infrastructure

CDMS were commissioned by Decmil Australia to provide civil, structural, electrical and mechanical engineering design and detailing services for the Defence Fuel Installation (DFI) remediation project at HMAS Stirling Naval Base on Garden Island, Western Australia.

OUTCOME

- Base wide piping network design and detailing for both AVCAT aviation fuel as well as diesel fuel.
- Installation of six new above ground fuel tanks and design of footings.
- Design and detailing of buried HDPE piping for upgrades to NFI fuel terminal layout.
- Design and detailing mechanical piping inside confined space entry wharves.
- Demolition and removal of redundant tanks and piping network, site wide.

PROJECT OBJECTIVES

The upgrades to the existing terminal included replacement piping system and associated equipment for the complete upgrade of the site wide diesel and aviation fuel infrastructure.

CHALLENGES

Some challenges were faced by CDMS when confirming the new piping design to both defence design specifications as well as Australian design standards together, while still providing cost savings for the construction contractor and the end user. There were many challenges when working on an operational Naval Base, around very old and out dated existing infrastructure, which is surrounded by active site services such as AVCAT and diesel fuel piping, electrical, air, water and sullage waste services. CDMS partnered with Decmil, when running new buried pipe services using HDPE around existing buried fuel and high voltage electrical services while maintaining conformance to Australian design standards.

OUR APPROACH

CDMS decided to use parametric pipe modeling software to streamline the design, minimising re-work when design changes took place. Autodesk Plant 3D was used to link piping and instrumentation drawings (P&ID's) to 3D models and 3D survey data to create shop fabrication isometric (ISO) drawings for construction.

Pipe stress analysis software (Caesar II) was used to check pipeline flexibility and position of anchor points, and expansion joints for long runs of pipe. Regular design development meetings with the client and naval base personnel (end user) to facilitate a workable and improved design around existing piping infrastructure and strict defence zoning regulations.