

## A Study on Codes and Standards used for Nuclear Grade Concrete

In order to increase the lifetime of the Koeberg Nuclear Power Plant (NPP) civil structures it is imperative to consider enhanced aging management that includes examination, inspection, maintenance and testing of concrete that provide safety and structural functions. Reinforced concrete is the dominant civil engineering construction material for nuclear power plant structures. South Africa does not have its own codes and standards for the manufacture of nuclear grade concrete that covers all aspects, such as the design, commissioning, inspection, testing and installation. Construction of high quality concrete structures in the nuclear industry is a key requirement due to the high integrity demands on concrete performance, to resist seismic, thermal and other normal operating demands such as radiation, plant faults e.g. anticipated operating occurrence or accident conditions to extreme environmental loading attributed to internal or external events. Many concrete elements in the plant become effectively inaccessible once it is operational due to high levels of radiation. Some countries have adopted local ISO accredited codes of practice for structural properties of concrete, consistent with specific requirements of the nuclear industry [1-3]. This desktop review assessed the French and US nuclear regulatory regime relating to nuclear grade concrete for the purpose of safety and structural functions in nuclear installations. This will inform any recommendations that the National Nuclear Regulator (NNR) may develop in relation to local engineering codes and standards for same applications.

### References

- [1]. ICRP. ICRP Publication 103. Ann. ICRP 37, 2 (2007)
- [2]. NESCC Concrete Task Group, Concrete Codes and Standards for Nuclear Power Plants, NIST, ANSI, (2011)
- [3]. R D Bucur et al 2017 IOP Conf. Ser.: Mater. Sci. Eng. 246 012036

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