Oil & Gas Naturally Occurring Radioactive Materials (NORM) - Comparison of Australian and Other First World Oil & Gas Industry Practices

Dean Crouch
Radiation Services Manager
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Distinct from nuclear fuel cycle waste

Nuclear waste arrives at temporary Lucas Heights storage facility after being processed in France

By Lara Haynes and staff
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Australia’s first import of reprocessed nuclear waste has arrived at its temporary storage facility in New South Wales without incident, after being repatriated from France.

In the early hours of Sunday morning, a tank holding 20 canisters of what is called immediate-level waste, was taken to the Australian Nuclear Science and Technology Organisation (ANSTO) facility at Lucas Heights.

The canisters, each about one metre in height and with a 170-litre capacity, were carrying about 26 tonnes of nuclear waste.

ANSTO’s head of nuclear services, Hed Griffiths, moved to allay concerns the tanks and the BBC Shanghai ship, which was commissioned to transport the waste, were unsafe.

NORM and potential hazards
NORM and potential hazards it may represent

Knowledge overcomes fear...sometimes

- Ionising radiation exposure to personnel during storage
- Incidents/accidents during transport
- Release to the environment
- Industrial Relations concerns and issues
- Lack of regulatory guidance
- Speculative accumulation
Disposal currently permitted in Australia

• Monazite (Th-232) concentrate stored at processing facility for return to mine void

• Delay and dispose
  – Nuclear medicine waste (Tc99m/Mo99), stored for approx. 10 half-lives then released as non-prescribed material

• Notable exemptions
  – Medical research waste (i.e. Sir Charles Gardiner Hospital)
  – Dis-used industrial sealed sources.
Legislative framework - Australia

ARPANSA (Comm)
ARPANS Act, 1998. *The object of this Act is to protect the health and safety of people, and to protect the environment, from the harmful effects of radiation.*

NOPSEMA (Comm)


Department of Environment and Water Resources (Comm)
Australian state and territory management

WA Radiation Safety Act, 1975 s34. Disposal permits

WA Radiation Safety (General) Regs, 1983 r31. Release or disposal of radioactive substances

ARPANSA - Code of Practice for radiation protection and radioactive waste management in mining and mineral processing, 2005

DMP(WA) - Managing naturally occurring radioactive material (NORM) in mining and mineral processing guideline, 2010
United States management

- Seen as a LLW (low level waste) product compared to high activity, radiotoxic products and decommissioning wastes produced throughout the enrichment to decommissioning stages of the nuclear fuel cycle.
- Adopts standards and expertise (technology and personnel) from the well established nuclear fuel cycle in North America.
- Federal regulator (NRC) and a number of states are more active in approving a smaller number of disposal facilities, rather than different bespoke waste management plans for a larger number of generators.
- Multiple disposal facilities are available and as such, directives to operators to ‘dispose of NORM immediately’ are reasonable requests, and can be expected to the executed in a reasonable amount of time.
UK management

• Numerous active LLW disposal facilities are currently operating by private operators

• Identified at the start of the project as a waste product of the petroleum industry during production and decommissioning

• Uses a graded approach to ensure Nuclear/non-nuclear and HLW to LLW classes of waste receive appropriate and practical disposal facilities. The approach allows for industry to provide cost effective solutions to the market

• UK Dept of Environment & Climate Change, SEPA, Welsh government and Northern Ireland Dept of Environment jointly adopted a strategy in 2014 for management of NORM within the greater waste hierarchy across UK

• Prohibits the import/export of radioactive waste for disposal purposes
Deferring the issue

“Let’s just store it for now and deal with the problem later….”

then

“The regulator has issued a directive to deal with the liability immediately!!!”
Speculative accumulation & its pitfalls
Management and increasing cost of disposal
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Speculative accumulation & its pitfalls

Storage in drums – in a perfect world
Speculative accumulation & its pitfalls
Deterioration of storage containers
Speculative accumulation & its pitfalls
Deterioration of storage containers
An exemption from the ARPANSA Transport Code **DOES NOT** equate to a material having no radiological hazards or being exemption from proper approved disposal.
**A method of point-of-generation disposal**

Practical, consistent guidance

- Packaging & storage guidance
- Testing, analysis and characterisation requirements & waste acceptance criteria (WAC)
- Processes defined for both Low Specific Activity (LSA) and Surface Contaminated Objects (SCO)
- Approval of a single non-nuclear LLW disposal facility, able to accept waste from all states, territories and commonwealth waters will spur a new niche in the waste management industry.
- Regulatory attention focused on only a few sites, thereby better serving the public interest.
Thank You for Your attention!

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