

## Sustainable Technologies for Decommissioning of Nuclear Facilities

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**Abstract :** The German nuclear industry, while implementing the German policy, believes that the journey towards the green-field, namely phasing out of nuclear energy, should be achieved through green techniques. The most important techniques required for the wide range of decommissioning activities are decontamination techniques, cutting techniques, radioactivity measuring techniques, remote control techniques, techniques for worker and environmental protection and techniques for treating, preconditioning and conditioning nuclear waste. Many decontamination techniques are used for removing contamination from metal, concrete or other surfaces like the scales inside pipes. As the pipeline system is one of the important components of nuclear power plants, the process of decontamination in tubing is of more significance. The development of energy sectors like oil sector, gas sector and nuclear sector, since the middle of 20th century, increased the pipeline industry and the research in the decontamination of tubing in each sector is found to serve each other. The extraction of natural products and material through the pipeline can result in scale formation. These scales can be radioactively contaminated through an accumulation process especially in the petrochemical industry when oil and gas are extracted from the underground reservoir. The radioactivity measured in these scales can be significantly high and pose a great threat to people and the environment. At present, the decontamination process involves using high pressure water jets with or without abrasive material and this technology produces a high amount of secondary waste. In order to overcome it, the research team within Karlsruhe Institute of Technology developed a new sustainable method to carry out the decontamination of tubing without producing any secondary waste. This method is based on vibration technique which removes scales and also does not require any auxiliary materials. The outcome of the research project proves that the vibration technique used for decontamination of tubing is environmental friendly in other words a sustainable technique.

**Keywords :** sustainable technologies, decontamination, pipeline, nuclear industry

**Conference Title :** ICEEWM 2015 : International Conference on Environment, Energy and Waste Management

**Conference Location :** Boston, United States

**Conference Dates :** April 20-21, 2015