원전 해체 주요 해외 사례 및 주요 공정분석

[10.1.2교시/10.2.1교시]

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5. Dismantling Technologies

5.1 Thermal Cutting Technique

Flame Cutting

- ✓ The most common and well-known thermal cutting tech. is flame cutting.
- ✓ Cutting of material thickness of roughly 500 mm is possible with a hand-hold torch, but most applications are for thickness less than 100 mm.
- ✓ This tech. is used in the dismantling of nuclear facilities for cutting pipes, steel beams turbines and their housings.

Thermic Lance

- ✓ A thermic lance is very small and simple tool for manual use with an outer diameter of about 10 mm.
- ✓ This process is a demolition tool, only reasonable for application on non-contaminated structures.

5. Dismantling Technologies

Plasma Arc Cutting (PAC)

- ✓ PAC process is based on an electrical arc between an electrode inside a torch and the workpiece.
- ✓ The plasma gas exits the torch through a nozzle as a jet with high kinetic energy.
- ✓ The main field of application is cutting material up to 40 mm thickness, especially tubes, pipes, and fittings made out of steel.
- ✓ The material thickness to be cut has a physical limit of about 180 mm.
- ✓ Underwater PAC is capable of cutting thin sheet structures up to a 130 mm. A thickness of 20 mm was successfully cut in water at a depth of 20 m.

5. Dismantling Technologies

- **Plasma Arc Cutting (PAC)**

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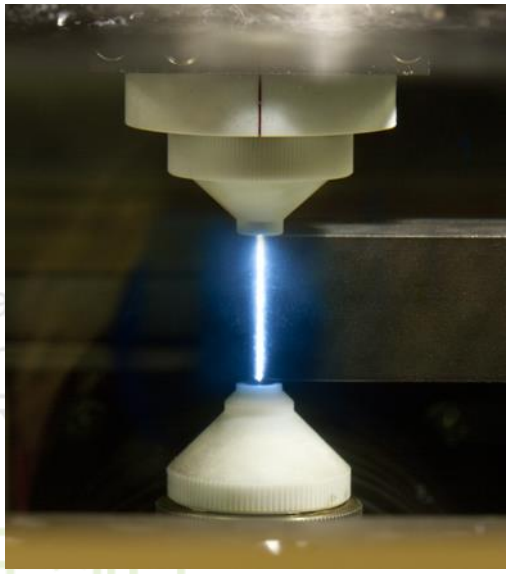
Electric Discharge Machining (EDM)

- ✓ EDM, or spark erosion, is originally a high precision manufacturing process.
- ✓ EDM is qualified and used as a repair and maintenance tool even in operating NPPs.
- ✓ Application of this process for dismantling purposes presents very specific requirements.
- ✓ Ex) tungsten carbide saw-tooth, disintegration of broken mechanical tools and removal of secure welds on screws, etc.



5. Dismantling Technologies

MDM machine becomes a high energy, low voltage, thermal shock-producing source. The electrode in the machine vibrates up and down 3,600 times a minute. Each time the electrode touches the piece to be burned, an arc is struck.

On average, MDM is 40% faster than conventional drilling.

5. Dismantling Technologies

- **Electric Discharge Machining (EDM)**