

Realizing Recycling Opportunities in Nuclear Power



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Lessons from a Teenage Entrepreneur



The Search for Value

- 100,000 lbs of metal
- Low removable Contamination levels 1000-5000 dpm/100cm²
- Large amount of Copper with high recycle value of 2.60/lb
- High cost of disposal through traditional radwaste path 2.60/lb
- Capital Project to replace 48 containment cooling coils
- Needed opportunity to inspect tubes

Containment Cooling Coil Project Callaway Project Goals

- 100% Recycle of Tubes
- Free Release and Re-use Specialized Containers
- Free Release and Re-use of all Racks and Frames
- 100% Recycle of Tubes
- Callaway Plant Engineers wanted to know how much sediment would be found on the outside of the tube sheets.



Containment Cooling Coil Project UniTech Capabilities

- Decontaminate and Free Release Services
- Recycling Program
- 50% Recycling Revenue Share
- Bulk Survey for Release

Containment Cooling Coil Project Description

- UniTech Oak Ridge (ORSC) is always willing to think outside of the box. This was a 1st time project for ORSC.
- The Callaway cooling coils were shipped from Callaway in (6) specialized boxes weighing approximately 26,000 pounds each.
- Container dimensions were 129" long x 89" wide x 164" high
- Inside each container were (2) racks which contained (4) coils per rack.
- The transportation was provided by I.C.E. Service Group utilizing specialized trailers.



Containment Cooling Coil Project

Racks replaced in the specialized container for return and reuse



Racks with new coils installed



Containment Cooling Coil Project



Callaway Plant Engineers wanted to find out how much sediment would be found on the outside of the tube sheet. This picture is typical of the material that was found when the head was separated from the sheet.

Containment Cooling Coil Project

After free release of the boxes and racks for the coils, ORSC started to process the coil assemblies. During this process, there were several phone calls, face time calls and a staff engineer visit to the ORSC facility.

Containment Cooling Coil Project

- ORSC staff removed the coils from the frames by cutting the coils at the tube sheets and support brackets.
- At this point, the coils and frames were characterized separately.
- Coil bundles ranged from 2,000-3,000 dpm/100cm² and the frames were 2,000-10,000 dpm/100cm².
- Frames were deconned by hand utilizing spray, Scotch Brite, and in some cases, light grinding.
- All frames were free released and verified using Gamma Spectroscopy.



Containment Cooling Coil Project

Several different methods of cleaning were tried but the coils could not be reduced to free release standards while the coils were intact (i.e. tubes with the fins wound around the tubes).

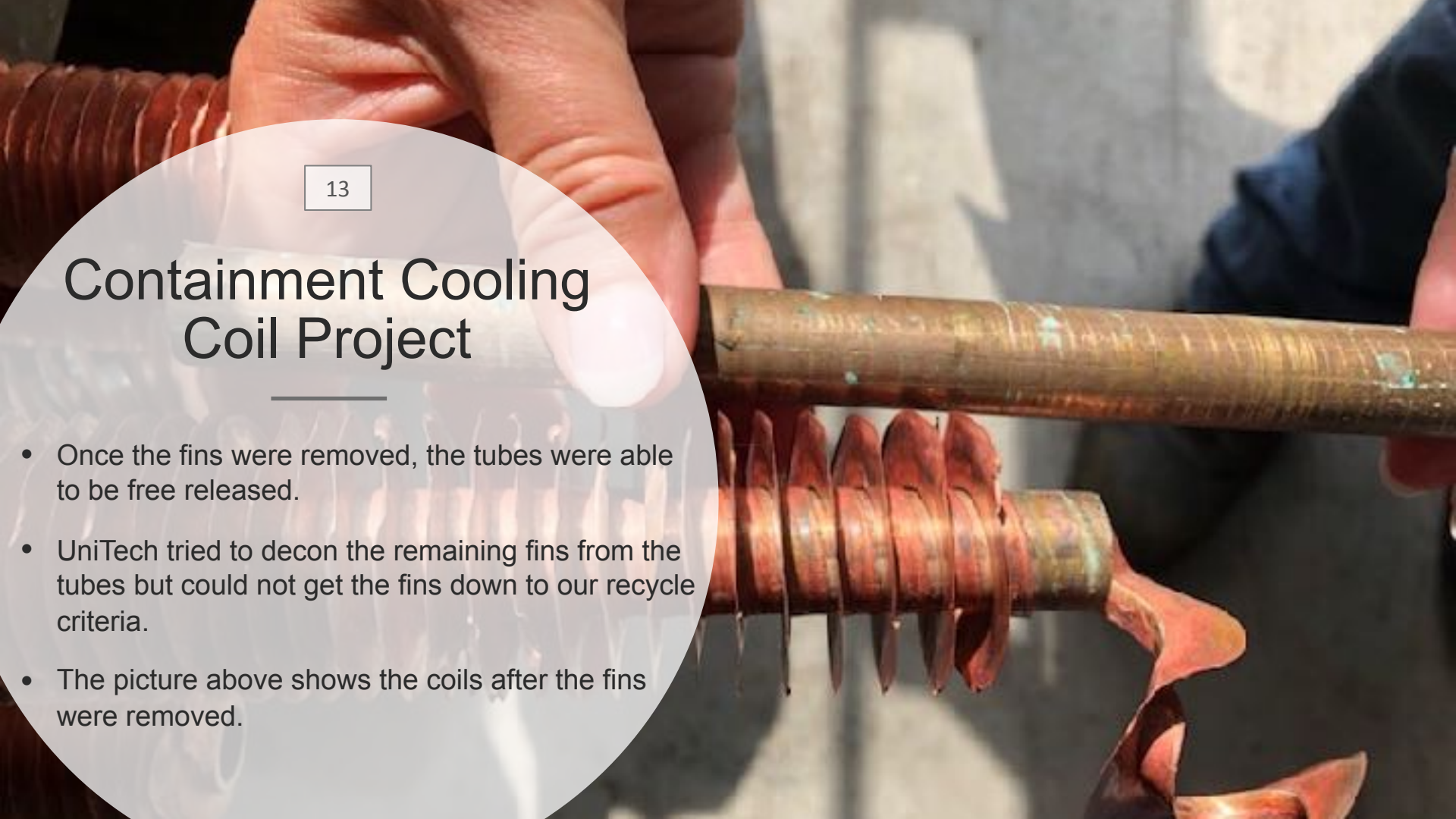
Containment Cooling Coil Project

- After numerous attempts at decon and release, it was decided to attempt to remove the fins from the tubes.
- It was discovered that a small amount of activity was trapped between the fins as well as a small amount that was trapped in between the winding of the fin.



Containment Cooling Coil Project

- Once the fins were removed, the tubes were able to be free released.
- UniTech tried to decon the remaining fins from the tubes but could not get the fins down to our recycle criteria.
- The picture above shows the coils after the fins were removed.



Containment Cooling Coil Project

- After the winding was removed, UniTech discovered that there were some tubes that actually split.
- All information gathered during this process was shared directly with the Callaway PM and Engineer.



Containment Cooling Coil Project

Copper Coils ready for recycling



Containment Cooling Coil Project Callaway Project Results

Total Project Weight: 151,232 lbs	
Recycled Tubes	27,511 lbs
Fins - Landfill Disposal	31,615 lbs
Frames - Deconned Free Release	39,066 lbs
Container/Racks - Deconned Free Released	53,040 lbs
Total Pounds LLRW Disposal	0 lbs
Total Recycling Revenue	\$ 39,380
Split Recycling 50/50 with Callaway	

Lessons from a Teenage Entrepreneur

- Look for Value
- Don't Settle for Easy
- Engage Others





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