Abstract Submitted
for the GEC15 Meeting of
The American Physical Society

Study on the decontamination of surface of radioactive metal device using plasmatron JONG-KEUN YANG, IK-JUN YANG, SEUNG-HYEON KIM, SURESH RAI, HEON-JU LEE, Jeju National University, NUCLEAR FUSION AND PLASMA APPLICATION LABORATORY TEAM — Radioactive waste contiguously produced during operation of NPP (nuclear power plant). Therefore, KHNP (korea hydro & nuclear power co., ltd) decided to disband the NPP unit 1 in the Kori area. Since most of the metallic radioactive wastes are not contaminated ones themselves but rather ones containing polluted nuclides on their surface, the amount of wastes can be sharply reduced through decontamination process. In this study DC plasmatron and isotope sheet of radioactive cobalt was used to study the decontamination process. Decontamination can be achieved by etching the contaminated layer from the surface. Due to the restricted usage of radioactive materials, we have studied etching of Cobalt (Co) sheet to imitate the radioactive contamination. Plasma was generated using mixture gas of CF4/O2 in the ratio of 10:0, 9:1, 8:2, 7:3, 6:4 maintaining the plasma sample distance of 20 mm, 30 mm, 40 mm and exposed time of 60 sec, 120 sec, 180 sec using fixed Ar carrier gas flow rate of 1000 sccm. As a result, we obtained maximum etching rate of 9.24 μm/min when the mixture ratio of CF4/O2 gas was 4:1, which was confirmed by SEM and mass-meter. It was confirmed that more close positioning the Co samples to the plasmatron nozzle yields maximum etching rate.

Jong-Keun Yang
Jeju National University

Date submitted: 18 Jun 2015 Electronic form version 1.4