

AECL

**INTERNATIONAL STANDARD PROBLEM ISP-41 FU/1 PDF
FOLLOW-UP EXERCISE (Phase 1):**

Containment Iodine Computer Code Exercise: Parametric Studies

By

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ABSTRACT

This report describes the results of the second phase of International Standard Problem (ISP) 41, an iodine behaviour code comparison exercise. The first phase of the study, which was based on a simple Radioiodine Test Facility (RTF) experiment, demonstrated that all of the iodine behaviour codes had the capability to reproduce iodine behaviour for a narrow range of conditions (single temperature, no organic impurities, controlled pH steps). The current phase, a parametric study, was designed to evaluate the sensitivity of iodine behaviour codes to boundary conditions such as pH, dose rate, temperature and initial I concentration. The codes used in this exercise were IODE(IPSN), IODE(NRIR), IMPAIR(GRS), INSPECT(AEAT), IMOD(AECL) and LIRIC(AECL). The parametric study described in this report identified several areas of discrepancy between the various codes. In general, the codes agree regarding qualitative trends, but their predictions regarding the actual amount of volatile iodine varied considerably. The largest source of the discrepancies between code predictions appears to be their different approaches to modelling the formation and destruction of organic iodides. A recommendation arising from this exercise is that an additional code comparison exercise be performed on organic iodide formation, against data obtained from intermediate-scale studies (two RTF (AECL, Canada) and two CAIMAN facility (IPSN, France) experiments have been chosen). This comparison will allow each of the code users to realistically evaluate and improve the organic iodide behaviour sub-models within their codes.

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