Contribution ID: **166** Type: **POSTER**

APPLICATION OF PHYSICAL MODELING WHEN CALIBRATING HIGH RANGE ELECTROMAGNETIC FLOWMETERS

Tuesday, June 27, 2017 5:30 PM (1h 30m)

At high flowrates the «drift» of magnetic field characterized by the criterion Rem = μ0σvD can be revealed in the readings of the electromagnetic flowmeters if it's magnetic field is insufficiently extensive. The modeling of high range flowmeters presented involves using a small on scale transducer sample as compared to full scale flowmeter maintaining similarity of measuring section and magnetic field distribution. The hydrodynamic and MHD criteria (Re,Rem), corresponding to full scale flow conditions can be provided at much lower flowrate values. The experiments were carried out at sodium calibration test facility IRS-M, using its main loop and two parallel auxiliary loops supplied by calibrated electromagnetic flowmeters. On the model of a measuring section with the pipe DN150 at a total flowrate G=360 m3/h the value Rem=7,5 has been achieved, that corresponds to parameter of the flowmeter installed in accident heat removal system of BN-800 reactor (Gmax = 720 m3/h, DN300). Calibration characteristics have been determined for different electrode pairs the longitudinal extension of magnetic field being Lm=0,7DN. An estimate of the nonlinearity introduced by the quadratic term in the dimensionless representation is obtained, E=k0(1 - αRem)Rem. The coefficient α can be used further to adjust the characteristic of the full scale flowmeter.

Country/Int. Organization

Russian Federation, JSC "SSC RF –IPPE"

Primary author: Mr SHURUPOV, Vadim Alexandrovich (JSC "SSC RF –IPPE")

Co-authors: Mr FOMIN, Alexandr (Joint Stock Company "State Scientific Centre of the Russian Federation – Institute for Physics and Power Engineering named after A. I. Leypunsky" (JSC "SSC RF –IPPE")); Mr KEBADZE, Boris Victorovich (JSC "SSC RF –IPPE")

Presenter: Mr SHURUPOV, Vadim Alexandrovich (JSC "SSC RF –IPPE")

Session Classification: Poster Session 1

Track Classification: Track 5. Fast Reactor Materials (Fuels and Structures) and Technology