Status of the spherical tokamak Globus-M2 project

V.B. Minaev¹, V.K. Gusev¹, M.I. Patrov¹, N.V. Sakharov¹, V.I. Varfolomeev¹,
N.N. Bakharev¹, E.N. Bondarchuk², A.K. Cherdakov², V.V. Dyachenko¹, A.A. Kavin²,
M.V. Khokhlov², S.V. Krasnov², G.S. Kurskiev¹, A.N. Labusov², Yu.V. Petrov¹,
A.N. Savelev¹, O.N. Shcherbinin¹, V.N. Tanchuk², A.A. Voronova², E.G. Zhilin³

¹ Ioffe Physical-Technical Institute of the Russian Academy of Sciences, St.Petersburg, Russia
² D.V.Efremov Institute of Electrophysical Apparatus, St.Petersburg, Russia
³ Ioffe Fusion Technology Ltd., St.Petersburg, Russia

The Globus-M spherical tokamak [1] demonstrated practically all of the project objectives
during its 15-year operation. The main factor, limiting further enhancement of plasma
parameters, is the relatively low toroidal magnetic field [2]. The increasing of the magnetic
field (from 0.4 up to 1.0 T) together with the plasma current (up to 0.5 MA) in the upgraded
tokamak should promote plasma performance and provide improved conditions for auxiliary
heating and current drive [3,4].

Evidently, that field value rise by a factor of 2.5 will entail serious increase in loads on the
magnetic system. Thereupon a review of the design was developed for the upgraded tokamak
Globus-M2 with respect to the concept described in [5]. Results of the finite element model
stress analysis are presented. The mechanical strength was enhanced significantly. Radius of
the toroidal coil outer limb was changed slightly in order to reduce field ripples. The central
column and the toroidal field coil joints were fully redesigned. As far as Globus-M2 poloidal
field coil positions do not changed with respect to Globus-M, it allowed keeping the full set of
plasma magnetic configurations available in the existing machine. The vacuum vessel remains
the same in order to reduce project cost. Detailed design of tokamak upgrade is discussed in
the report as well as current status of the work.

References:
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