

Safety and environmental issues for construction of a nuclear power plant at Brazilian northeast semi-arid

M. A. V. Wasserman¹, V. B. Martins¹, M. L. Moreira¹, T. S. Cunha¹, F. F. L. Simões Filho¹, C. M. F. Lapa¹
e-mail: mwasseman@ien.gov.br

¹ Division of Nuclear Engineering - IEN

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Abstract

The objective of this paper is to discuss safety issues and environmental impact arising from the placement of nuclear power plants at São Francisco river basin. This approach considered the water availability throughout the year, the maintenance of thermal balance and climate changes. The present discussion pointed to the necessity of a long term management plan for the various uses of São Francisco basin. An economic and social approach of the impacts of nuclear power plants operation and other agricultural and industrial activities in the region are also necessary. Finally, it suggests the adoption of a variable-cycle cooling system, which enables operation for all kinds of hydrological conditions previewed to the São Francisco basin.

Discussion

The proposal to adapt a process of dissipation of heat generated in the plant operation conditions typical of a semi-arid region implies a careful consideration of the issues already mentioned: lack of water, climate change and long-term impacts of raised temperature of the São Francisco river. It seems that the choice of somewhere in the basin of

São Francisco for the construction of a nuclear power plant should be based on the limnological vulnerabilities that exist along the basin, to establish a balance between the current thermal impact and its reversibility in this scenario particularly critical, and the long-term impact, whose reversibility is questionable. Also, it is still necessary to survey the characteristics of the species found along the river: its sensitivity to temperature and oxygen and their socio-economic importance for the region. The Site selection ought to limit the impact of a given specie at the location where the effluent is discharged, without disturbing the reproduction and the density population in other locations of the river in order to avoid the extinction of the endangered species. Finally, due to recent experience, it is essential for the region a management plan for the various uses of the waters of São Francisco river. It must be considered the economic and social approach of the impacts of the construction of nuclear power plants and other uses. It should be taken into account the issues related to drought, flooding and pollution [1].

References

- [1] Wasserman, M. A. V.; Martins, V. B.; Moreira, M. L.; Cunha, T. S.; Lamego, Francisco Fernando; Lapa, C. M. F. - *Safety and environmental issues for construction of a nuclear power plant at Brazilian northeast semi-arid. In: IWA World Congress on Water, Climate and Energy*, Dublin, Irlanda: International Water Association - IWA, 2012.