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Opponent's review of the Doctoral Thesis

Candidate Mgr. Yuliia Khmurovska

Title of the doctoral thesis Influence of Neutron and Gamma Irradiation on Concrete Properties and Structural Performance

Branch of study Konstrukce a dopravní stavby (Structural and Transportation Engineering)

Tutor prof. Ing. Petr Štemberk, Ph.D., D.Eng.

Opponent Dr. Kyoungsoo Park

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Topicality of the doctoral thesis theme

Commentary: Investigation on irradiated concrete is essential research area for long-term operation of nuclear power plants.

excellent above average average below average poor

Fulfilment of the doctoral thesis objectives

Commentary: The effect of gamma-ray irradiation on cement mortar creep is experimentally investigated, and concrete biological shield is numerically investigated. The contribution of the thesis is unique.

excellent above average average below average poor

Research methods and procedures

Commentary: The experimental program is well organized to investigate the effect of gamma-ray irradiation on cement mortar creep.

excellent above average average below average poor

Results of the doctoral thesis – dissertant's concrete achievements

Commentary: Although irradiation testing is challenging, the experimental results are consistent. For example, this study identified that gamma-ray slightly affected cement mortar creep although experimental results had relatively large scatter.

excellent above average average below average poor

Importance for practice and for development within a branch of science

Commentary: For the long-term operation of nuclear power plants, degradation mechanisms of concrete is of important issues. Among various degradation mechanisms, irradiation effects on concrete should be thoroughly investigated.

excellent above average average below average poor

Formal layout of the doctoral thesis and the level of language used

Commentary: The thesis is well written and organized, and the quality of figures is excellent.

excellent above average average below average poor

Remarks

I have one suggestions after finishing PhD, and thus the below suggestion is not the requirement but potential extension for future study.
Ms. Khmurovska may consider to reproduce experimental results in Chapters 4 and 5 using numerical methods presented in Chapter 2. The comparison between the numerical model and experimental results will strength the validity of the test results and computational modelling.

Final assessment of the doctoral thesis

The thesis is very well organized, and provides unique contribution to irradiated concrete research area.

Following a successful defence of the doctoral thesis I recommend the granting of the Ph.D. degree

yes no

Date: Aug. 28, 2019

Opponent's signature: 