CURRICULUM VITAE

PERSONAL INFORMATION

Name	Stempniewicz Marek, Michal
Nationality	Polish
Web-site	https"//www.marek-stempniewicz.???
E-mail:	stempniewicz@nrg.eu
	stempniewicz@thorizongroup.nl

CORE COMPETENCES

• *Physics*	Thermal-hydraulics, Heat and mass transfer, Nuclear physics, Nuclear safety
• *Analyses*	Design-support, Design basis accidents, Severe accidents, PSA
• *System codes*	RELAP5, TRAC/TRACE, MELCOR, MAAP, CONTAIN, SPECTRA
• *Programming*	Numerical algorithms, Code development
• *Programming languages*	Fortran, Pascal, Basic, C++
• *Codes development*	SPECTRA (system thermal-hydraulics), TASAC (severe accident)

LANGUAGES

• *Native speaker*	Polish
• *Professional fluency*	English
• *Weak knowledge*	Russian, Dutch

EDUCATION

• *1982-1987*	MSc, Silesian Technical University, Mechanics & Power Systems
• *1996-2001*	PhD, Silesian Technical University

EXPERIENCE RECORD

• *1989-1992* Institute of Atomic Energy, Otwock, Poland

- Thermal hydraulic design analyses for VVER-440 and VVER-1000 reactors using the computer codes RELAP4/MOD6, RELAP5/MOD2.
- Modelling of reactor safety experiments within a scope of International Standard Problems: BETHSY, (Italy), using RELAP5.
- Development of the severe accident code TASAC.
- Analysis of PHEBUS B9+ (France) test with TASAC.

• *1992-1998*	KEMA Nuclear, Arnhem, The Netherlands o Analyses of PANDA experiments, PSI, (Switzerland) with TRAC-BF1, TRACG. o Thermal-hydraulic analyses for GKN Doodewaard (BWR) with TRAC-BF1. o PSA Level 2 analyses for GKN Doodewaard (BWR) with MELCOR o TRAC-BF1.and severe accident analyses, using the computer codes: CONTAIN, MAAP, MELCOR, STCP, TRAC-BF1, TRACG. These analyses are performed mainly for the BWR and PWR type reactors, operating presently in the Netherlands. o Simulations of NUPEC experiments using MAAP4/BWR. o Severe accident analyses EZS Borssele (PWR) with MAAP4/PWR o Analyses of High Pressure Melt Ejection and the Direct Containment Heating for GKN Doodewaard (BWR). o Initiation of the PhD work: development of thermal-hydraulic code SPECTRA
• *1998-now*	NRG, Nuclear Research & Consultancy Group, Arnhem, The Netherlands o Finalization of the PhD work: development of thermal-hydraulic code SPECTRA. o PSA Level 2 analyses for EZS Borssele (PWR) with MELCOR o Hydrogen distribution and recombiner analyses for EZS (PWR) with MELCOR and SPECTRA. o Analyses of Belgium PWR plants with RELAP5. o Analyses of Generic Containment with MELCOR and SPECTRA. o Spent fuel pool accident analyses with MELCOR and SPECTRA, within SARNET2 FP7. o PSA Level 2 analyses for KERENA (SWR-1000) with MELCOR. o Design-support analyses of High Flux Reactor (HFR) in Petten with RELAP5 and SPECTRA. o Validation of RELAP5 and SPECTRA for natural circulation boiling in narrow channels (HFR geometry). o Extensions of SPECTRA towards HTRs - dust and fission product transport, deposition and resuspension phenomena. o Design-support and safety analyses of PBMR (South Africa) with SPECTRA (commercial contract). o Analysis of graphite oxidation experiment NACOK with SPECTRA and TINTE. o Design-support and safety analyses of HTR-PM (China) with SPECTRA (commercial contract). o Design-support and safety analyses of HTR-10 (China) with SPECTRA (commercial contract). o Design-support analyses of the European Modular High Temperature Gas-cooled Reactors (HTGR) within the GEMINI+ project, with SPECTRA and MELCOR o Analysis liquid metal (sodium) reactor EBR-II with SPECTRA, within IAEA CRP. o Analysis liquid metal (sodium) reactor ASTRID-like core with SPECTRA in the frame of the ESNII+ FP7 EU Project. o Analysis liquid metal (sodium) reactor ESFR with SPECTRA. o Analysis liquid metal (lead) reactor LEADER with SPECTRA. o Extensions of SPECTRA towards MSRs - drift of fission products, including the delayed neutron precursors. o Analysis of LUMOS loop (sub-critical molten salt loop powered by HFR) with SPECTRA.

- Development of interactive simulators
  - KCB (PWR), MELCOR/VISOR simulator
  - LFR, SPECTRA/VISOR simulator
- Development of interactive coupling system code - CFD code
  - SPECTRA / CFX
  - SPECTRA / Fluent
- Coupled SPECTRA - CFD code analyses, within SESAME project
  - Benchmark on Phénix reactor
  - Benchmark on CIRCE-HERO test facility, ENEA, Italy
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• *2019-now*

Thorizon Group, The Netherlands

- Design-support and safety analyses of the Thorizon molten salt reactor concept with SPECTRA.

PUBLICATIONS

M.M. Stempniewicz, "Simulation of Containment Transient Response During Accidents in Advanced Reactor Types. The Computer code SPECTRA", *PhD Thesis, Institute of Thermal Technology, Silesian Technical University*, Poland, NRG report No. 21437/00.052167/P, May 12, 2000.

M.M. Stempniewicz, "Analysis of PANDA Passive Containment Cooling Steady-State Tests with the Spectra Code". *Nuclear Technology*, Vol. **131**, No. 1, pp. 82-101, July 2000.

M.M. Stempniewicz, "Analyses of ISP-42, PANDA tests, with the SPECTRA code". *Proceedings of ICONE-9*, Nice, France, 8 April 2001.

M.M. Stempniewicz, E.M.J. Komen, "Model of Particle Resuspension in Turbulent Flows", *Proceedings HTR-2006: 3rd International Topical Meeting on High Temperature Reactor Technology*, Johannesburg, South Africa, 1-4 October 2006.

E.A.R. de Geus, M.M. Stempniewicz, "Application of SPECTRA on PBMR V704 Design", *Proceedings HTR-2006: 3rd International Topical Meeting on High Temperature Reactor Technology*, Johannesburg, South Africa, 1-4 October 2006.

Sule Ergun, Jason G. Williams, Lawrence E. Hochreiter, Hergen Wiersema, Marcel Slootman, Marek Stempniewicz, "COBRA-TF Analysis of the High Flux Reactor Hot Channel for a Postulated Large-Break Loss-of-Coolant Accident", *Nuclear Technology*, Vol. **163**, No. 2, pp. 273-284, August 2008.

M.M. Stempniewicz, E.M.J. Komen, A. de With, "Model of Particle Resuspension in Turbulent Flows", *Nuclear Engineering and Design*, **238**, pp. 2943-2959, 2008.

M.M. Stempniewicz, A. de With, "GCFR Design Optimization for Passive Safety", *The 13th International Topical Meeting on Nuclear Reactor Thermal Hydraulics, NURETH-13*, Kanazawa City, Japan, September 27 - October 2, 2009.

M.M. Stempniewicz, "Coefficients for I-131 Sorption on Different Surfaces", Proceedings of the 18th International Conference Nuclear Engineering,

ICONE18, Xi'an, China, May 17-21, 2010.

M.M. Stempniewicz, E.M.J. Komen, "Comparison of Several Resuspension Models Against Measured Data", *Nuclear Engineering and Design,* **240** (2010) 1657–1670.

M.M. Stempniewicz, "Analysis of Dust and Fission Products in NGNP Plant", *Proceedings of HTR 2010*, Prague, Czech Republic, October 18-20, 2010

Yanhua Zheng, Marek M. Stempniewicz, "Investigation of NACOK Air Ingress Experiment Using Different System Analysis Codes", Paper 120, *Proceedings of HTR 2010*, Prague, Czech Republic, October 18-20, 2010

Yanhua Zheng, Marek M. Stempniewicz, "Investigation of NACOK Air Ingress Experiment Using Different System Analysis Codes", *Nuclear Engineering and Design*, **251** (2012) 423– 432

M.M. Stempniewicz, L. Winters, S.A. Caspersson, "Analysis of dust and fission products in a pebble bed NGNP", *Nuclear Engineering and Design* **251** (2012) 433– 442

M.M. Stempniewicz, D. Wessels, "Analysis of Fission Products in PBMR Turbine", *Proceedings of the HTR 2014* Weihai, China, October 27-31, 2014, Paper HTR2014-61288.

M.M. Stempniewicz, P. Goede, "Sorption Coefficients for Iodine, Silver, and Cesium on Dust Particles" *Proceedings of the HTR 2014* Weihai, China, October 27-31, 2014, Paper HTR2014-61289.

M.M. Stempniewicz, "Correlation for Steam-Graphite Reaction", *Nuclear Engineering and Design* Vol. **280**, pp. 285-293, December 2014.

M.M. Stempniewicz, M.L.F. Slootman, H.T. Wiersema, "Validation of system codes RELAP5 and SPECTRA for natural convection boiling in narrow channels", *Nuclear Engineering and Design*, 307, (2016), 130-143.

M.M. Stempniewicz, "Air Oxidation of Zircaloy - Part I - Review of Current Models and Correlations", *Nuclear Engineering and Design*, 301 (2016) 402-411.

M.M. Stempniewicz, "Air Oxidation of Zircaloy - Part II - New Model for Zry-4 Oxidation", *Nuclear Engineering and Design*, 301 (2016) 412-422.

M.M. Stempniewicz, P. Goede, "Sorption Coefficients for Iodine, Silver, and Cesium on Dust Particles", *Nuclear Engineering and Design*, 306, (2016) 69-76

M.M. Stempniewicz, Chen Zhipeng, Zheng Yanhua, E.M.J Komen, "Resuspension models for monolayer and multilayer deposits of graphite dust", Annals of Nuclear Energy 120 (2018) 186–197

Zheng Yanhua, Marek M. Stempniewicz, Chen Zhipeng, Shi Lei, "Study on the DLOFC and PLOFC accidents of the 200 MWe pebble-bed modular high temperature gas-cooled reactor with TINTE and SPECTRA codes", Annals of Nuclear Energy 120 (2018) 763–777

E. Bubelis, et al., "System codes benchmarking on a low sodium void effect SFR heterogeneous core under ULOF conditions", Nuclear Engineering and

Design 320 (2017) 325–345

M.M. Stempniewicz, E.A.R. de Geus, F. Roelofs, "NRG analysis of SFR heterogeneous core under ULOF conditions", Nuclear Engineering and Design 339 (2018) 65–74

M.M. Stempniewicz, P.A. Breijder, H.J. Doolaard, F. Roelofs, "Multi-scale Thermal Hydraulic Analysis of the EBR-II Loss of Flow Tests SHRT-17 and SHRT-45R", The 17th International Topical Meeting on Nuclear Reactor Thermal Hydraulics (NURETH-17), Paper 21062, Qujiang Int'l Conference Center, Xi'an, China, September 3 - 8, 2017

M.M. Stempniewicz, E.A.R. de Geus, F. Roelofs, "A New Model to Simulate Molten Fuel Systems with the SPECTRA Code", The 17th International Topical Meeting on Nuclear Reactor Thermal Hydraulics (NURETH-17), Qujiang Int'l Conference Center, Xi'an, China, September 3 - 8 (2017).

M.M. Stempniewicz, E.A.R. de Geus, , F. Alcaro, S. de Groot, P.R. Hania, G. de Jong, K. Nagy, F. Roelofs, "Design and Safety Support Analyses of an In-Pile Molten Salt Loop in the HFR with the Spectra Code", The 17th International Topical Meeting on Nuclear Reactor Thermal Hydraulics (NURETH-17), Xi'an, China, September 3 - 8, 2017.

M.M. Stempniewicz, E.A.R. de Geus, F. Roelofs, "Analysis of Molten Salt Natural Circulation in Mk1 PB-FHR with SPECTRA", Thorium Energy Conference 2018 - ThEC18, October 29-31, 2018, Brussels, Belgium.

M.M. Stempniewicz, E.A.R. de Geus, F. Alcaro, P.R. Hania, K. Nagy, N.L. Asquith, J. de Jong, L. Pool, S. de Groot, F. Roelofs, "Design and Safety Support Analyses of an In-pile Molten Salt Loop in the HFR", Thorium Energy Conference 2018 - ThEC18, October 29-31, 2018, Brussels, Belgium.

M.M. Stempniewicz, Chen Zhipeng, Zheng Yanhua, E.M.J. Komen, "Resuspension models for monolayer and multilayer deposits of graphite dust", Annals of Nuclear Energy 120 (2018) 186–197.

Zheng Yanhua, Marek M. Stempniewicz, Chen Zhipeng, Shi Lei, "Study on the DLOFC and PLOFC accidents of the 200 MWe pebble-bed modular high temperature gas-cooled reactor with TINTE and SPECTRA codes", Annals of Nuclear Energy 120 (2018) 763–777.

F. Roelofs, M.M. Stempniewicz, "Molten Salt Modelling Capabilities in SPECTRA and Application to MSRE", Advances in Thermal-Hydraulics, 2020.