

Annual Activity report			
Year	2018		
Co-Chairs	<p>Aleksandar Sedmak, Faculty of Mechanical Engineering, University of Belgrade, Serbia</p> <p>José A.F.O. Correia, INEGI & Faculty of Engineering, University of Porto, Portugal</p> <p>Vladimir Moskvichev, Institute of Computational Technologies SB RAS, Krasnoyarsk Branch Office, Russia</p>		
Secretary	<p>Abílio M.P. De Jesus, INEGI & Faculty of Engineering, University of Porto, Portugal</p> <p>Elena Fedorova, ICT SB RAS, Krasnoyarsk Branch Office, Siberian Federal University, Russia</p> <p>Snežana Kirin, Faculty of Mechanical Engineering, University of Belgrade, Serbia</p>		
Meetings	Date	Location	Attendance
	2018-08-28	Belgrade, Serbia	X
	2018-09-05	Porto, Portugal	X
Current Round Robin Activities	---		
New/Proposed Round Robin Activities	---		
New/Proposed Collaborative Research	<p>Fracture Mechanics Applied to the Risk Analysis and Safety of Technical Systems (Russian colleagues) – Ongoing.</p> <p>Degradation Theory of Long Term Operated Materials (Portuguese-Polish-Ukraine colleagues) – Ongoing.</p> <p>Fatigue Evaluation in Offshore and Onshore Structures, José A. F. O. Correia, Abílio M. P. De Jesus, C. Rebelo, Rui A.B. Calçada (Editors & Authors), ISBN ---, Springer International Publishing – 2019.</p> <p>Fatigue Analysis in Bridge Structures, José A. F. O. Correia, Abílio M. P. De Jesus, C. Rebelo, Rui A.B. Calçada (Editors & Authors), ISBN --, Springer International Publishing – 2019.</p> <p>Modeling of Offshore Structures, Nicholas Fantuzzi, José A. F. O. Correia (Editors & Authors), ISBN ---, Springer International Publishing – 2019.</p> <p>First International Symposium on Risk Analysis and Safety of Complex Structures and Components (IRAS2019), FEUP, Porto, Portugal, July 01-02, 2019.</p>		

	<p>Workshop on Risk based Fracture Mechanics Analysis, Belgrade (Serbia), October 2019.</p> <p>ESIS/TC12 decided to create the Robert Moskovic Award in honor of the founder of TC12 as well as the ESIS/TC12 Young Scientist Award dedicated to the best contributions at TC12 symposium.</p>
<p>Publications and Dissemination Activities</p>	<p>Events:</p> <p>a) Thematic Session: Risk Analysis and Safety of Technical Systems, 22nd European Conference on Fracture (ECF22), Belgrade, Serbia, August 26-31, 2018.</p> <p>b) Thematic Session: Risk analysis and Safety of Large Structures and Components, XIX International Colloquium Mechanical Fatigue of Metals (ICMFM19), Porto (Portugal), 5-7 September, 2018.</p> <p>c) VI National Conference on Safety and Monitoring of Technological and Environmental Systems organized by Institute of Computational Technologies of Siberian Branch of Russian Academy of Sciences in Krasnoyarsk, 18th - 21th September, 2018.</p> <p>Publications:</p> <p>Special issue in Engineering Failure Analysis related with the IRAS 2017 Symposium on Risk analysis and Safety of Large Structures and Components, organised within of the "2nd International Conference of Structural Integrity (ICSI)", which took place on the beautiful Madeira Island, Portugal, on 4-7 September 2017.</p> <p>José A.F.O. Correia, Abílio M.P. De Jesus, António A. Fernandes, Rui A.B. Calçada, "Mechanical Fatigue of Metals - Experimental and Simulation Perspectives", in "Structural Integrity", Correia, José António, De Jesus, Abílio M.P. (Book Series Editors), Publisher: Springer, 2018.</p> <p>Proceedings of the 19th International Colloquium on Mechanical Fatigue of Metals. Book of Abstracts, Abílio M.P. De Jesus, José A.F.O. Correia, Ana M.A. Neves, Rui A.B. Calçada, António A. Fernandes; (Ed.), ISBN. 978-972-752-237-8, 2018.</p> <p>Vučetić, I., Kirin, S., Vučetić, T., Golubović, T., Sedmak, A. Risk analysis in the case of air storage tank failure at RHPP bajina bašta, Structural Integrity and Life (2018) Vol. 18(1), pp. 3-6</p> <p>Golubovic Tamara, Sedmak Aleksandar, Spasojevic-Brkic Vesna, Kirin Snezana, Veg Emil. Welded joints as critical regions in pressure vessels - case study of vinyl-chloride monomer storage tank, HEMIJSKA INDUSTRIJA, (2018), vol. 72 br. 4, str. 177-182</p> <p>Golubovic Tamara, Sedmak Aleksandar, Spasojevic-Brkic Vesna, Kirin Snezana, Rakonjac Ivan. Novel Risk Based Assessment of Pressure Vessels Integrity, TEHNICKI VJESNIK-TECHNICAL GAZETTE, (2018), vol. 25 br. 3, str. 803-807.</p> <p>Books:</p>

	<p>a) Monotonic and Ultra-Low-Cycle Fatigue Behaviour of Pipeline Steels, <i>Experimental and Numerical Approaches</i>, António Augusto Fernandes, Abílio M.P. de Jesus, Renato Natal Jorge (Editors & Authors), IX, 524, 2018, eBook ISBN 978-3-319-78096-2, Springer International Publishing.</p> <p>b) Degradation Theory of Long Term Operated Materials (Portuguese-Polish-Ukraine colleagues) – Ongoing.</p> <p>Chapters:</p> <ol style="list-style-type: none"> 1) Theoretical background of the degradation theory of structures; 2) Material aspects of the degradation theory; 3) Corrosion of metals and diagnostic role of electrochemical parameters; 4) Case study: Structural, fractographic and mechanical aspects of the steels degradation of the hyperboloid gridshell towers; 5) Structural Integrity assessment of old structures based on fatigue and fracture mechanics approach; 6) Steel members and joints – numerical modeling and structural integrity assessment; <p>c) Fracture Mechanics Applied to the Risk Analysis and Safety of Technical Systems (Russian colleagues) – Ongoing.</p> <p>Chapters:</p> <ol style="list-style-type: none"> 1) Statistics of failure of technical systems: causes, conditions and the main types of defects; 2) Analysis and harmonization of national and international regulatory documents in the area of technical systems safety and risk-analysis; 3) Characterization of the mechanical and physical properties of structural materials under severe conditions of service; 4) Characterization of the mechanical and physical properties of polymers and composite materials; 5) Fracture toughness characterization; 6) Maintenance of the load bearing capacity of technical systems using the criteria of Fracture Mechanics; 7) Applied problems of reliability of technical systems; 8) Applied problems of risk analysis and safety of technical systems.
<p>Status of Standardisation Projects</p>	<p>The discussion about standardization projects is on-going. The subcommittees will discuss the standardization projects during the next meeting in the First International Symposium on Risk Analysis and Safety of Complex Structures and Components (IRAS2019) FEUP, Porto, Portugal, July 01-02, 2019.</p>

TC12 on Risk analysis and safety of large structures and component

	<p>Projects:</p> <p>The European project called "FASTCOLD - FATigue STrength of COLD-formed structural steel details" aims to develop design fatigue curves of details made of cold-formed profiles. The FEUP coordinator is Prof. Abílio De Jesus (FEUP, Porto).</p> <p>The National project called "FIBERBRIDGE - Fatigue strengthening and assessment of railway metallic bridges using fiber-reinforced polymers" aims the fatigue strengthening and assessment of railway metallic bridges using fiber-reinforced polymers. The FiberBridge expected results include the identification of positive contributions in the dynamic analysis and fatigue life prediction of the FRP plates application in critical details of the railway metallic bridges, as well as the development of important procedures/guides for the design codes. The coordinators are Prof. Rui Calçada and José António Correia (INEGI & FEUP, Porto).</p> <p>Research projects financed by the Serbian Ministry for Education, Science and Technological Development: Risk analysis in mining industry - TR 33044, New Advances in Fracture Mechanics and Structural Integrity - OI 174004. The coordinator is Prof. Aleksandar Sedmak (University of Belgrade, Serbia).</p>
<p>Subcommittees details and activities</p>	<p>ESIS TC12 WG1: Engineering Structures and Technologies Chairs: José António Correia, Grzegorz Lesiuk & Pedro Montenegro</p> <p>ESIS TC12 WG2: Safety of Technical Systems Chairs: Aleksandar Sedmak & Vladimir Moskvichev</p> <p>ESIS TC12 WG3: Reliability and Probabilistic Approaches Chairs: Miguel Calvente & Shun-Peng Zhu</p> <p>ESIS TC12 WG4: Environmental effect on structural integrity Chairs: Elena Federova</p> <p>ESIS TC12 WG5: Structural integrity of composite materials and structures Chairs: Lothar Kroll & Wojciech Błazejewski</p>