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On Submitting Manuscripts: Requirements and Recommendations for Authors

1 INTRODUCTION

The journal *Design Problems and Knowledge Management* (DPKM) publishes research articles, reviews and notes (hereinafter referred to as “article”) that address the problems faced by designers of aircraft, helicopters, space and aerospace vehicles, nuclear power plants and other complex technical systems, including issues of interdisciplinary research and development. Since the design process is knowledge-based, the scope of the journal also covers relevant issues of knowledge management.

Publications in the journal are free of charge – both for authors and readers. Anyone can submit a manuscript for publication. The manuscript is reviewed by the editorial board and assessed in terms of its compliance with the topics of the journal, scientific novelty and practical significance for design and knowledge management. If the result of this assessment is positive, then the technical quality of the manuscript is checked. The checking criteria are strict enough to ensure high quality of the journal design and reduce editorial processing efforts. These criteria are presented below as requirements and recommendations for authors.

If the manuscript meets all the criteria considered, it is accepted for editorial processing, and upon its completion, it is published in the next issue of the journal. If any criteria are not met, the author is provided with comments regarding the necessary revision of the manuscript. After taking these comments into account and revising the manuscript accordingly, the author may submit a corrected manuscript for publication.

2 REQUIREMENTS

2.1 General requirements

2.1.1 A manuscript must be written in English and submitted as an MS Word file in the “docx” format.

2.1.2 The manuscript must include such mandatory elements as the article title, information about the author(s), an abstract, a set of keywords, and the main body of the article.

2.1.3 If the main part of the article contains, in addition to text, tables, images and mathematical or chemical formulas, they must be inserted into the text.

2.1.4 All the above elements of the article must be original. In this case, the copyright of the author(s) is recognized by default. If any element is borrowed from another source, this source must be referenced. If the borrowed element is protected by copyright, then to avoid copyright infringement, the article must indicate the author and/or copyright holder, and there must be permission to use the element. To confirm the permission, a corresponding letter from the copyright holder must be applied to the submitted manuscript. This letter can be a copy of the relevant email sent to the author from the copyright holder.

2.1.5 The submitted manuscript must not contain information that is restricted in distribution by national laws or prohibited from distribution by international law.

2.2 Specific requirements

2.2.1 The margins in the manuscript layout must be set in MS Word as “normal”: top and bottom – 2 cm, left – 3 cm, right – 1.5 cm.

2.2.2 The article title must be typed in Cambria font, size 16 pt, bold, with 12 pt intervals before and after it, line spacing “single”, centered. Individual words must begin with capital letters. The title of this editorial can serve as an example. If there is a subtitle, it must be typed on a new line, in Cambria font, size 14 pt, bold, with other settings as above.

2.2.3 The title of each of the main sections of the article must be typed in Times New Roman font, bold, size 12 pt, with 12 pt intervals before and after it, line spacing “single”, left-aligned. All words must be written in capital letters. Examples are the section titles of this editorial given above: **1 INTRODUCTION** and **2 REQUIREMENTS**.

2.2.4 The title of each subsection must be typed in Times New Roman font, bold, size 12 pt, with 12 pt interval before it and 6 pt after it, line spacing “single”, left-aligned. The title starts with a capital letter, the rest are lowercase. As an example, see the subsection titles given in this section: **2.1 General requirements** and **2.2 Specific requirements**.

2.2.5 The subsection text must be typed in Times New Roman 12 font, with line spacing factor 1.15, aligned to the width (left and right edges) of the page.

2.2.6 If a subsection includes sub-subsections, they must be separated from each other by 6pt intervals before and after them, as shown in this subsection.

2.2.7 Sections, subsections and sub-subsections must be numbered. Their numbers (not page numbers) are used for cross-references.

2.2.8 Abbreviations must be spelled out the first time used with the abbreviation in parentheses.

2.2.9 The following items are abbreviated when they are used in combination with numbers:

- units (SI units are preferred);
- cross-references to other parts of the manuscript or another publication (Vol., Chap., Sect., Fig., Eq.).

However, they are not abbreviated if they are at the beginning of a sentence.

2.2.10 Digits are used for all numbers larger than ten. When a number is used with a unit, the numeral is used and the unit is abbreviated. Commas are used to separate thousands and the decimal point to separate decimals.

3 RECOMMENDATIONS

3.1 General provisions

3.1.1 The recommendations we give to authors are aimed at ensuring high quality publication and can be considered as guidelines for manuscript preparation. They cover the design of the main elements of the article.

3.1.2 Elements such as the article title, information about the author(s), abstract and the set of keywords form a front part of the article. Its recommended design (taking into account the mandatory requirements given in Sect. 2) is presented below in Sect. 3.2.

3.1.3 The elements of the main body of the article are discussed in Sect. 3.3.

3.2 Front part of the article

The front part of the article (front matter) should contain the title, the author(s), affiliation information, email address, and copyright notice. The following can be used as a sample of this part.

<Start of the sample>

Advanced Concept for Designing Technical Systems: SPARS

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Abstract

This article describes an advanced concept of engineering design: Smart ProActive Resilient System (SPARS). It is applicable to the development of aircraft, nuclear facilities and other complex, safety-critical and expensive technical systems. ...

Keywords: design, technical system, uncertainty, safety, aircraft, nuclear facility, ...

< End of the sample>

3.3 Elements of the main body of the article

3.3.1 The elements of the main body of the article include: text, tables and lists, figures and illustrations, references, footnotes.

3.3.2 When forming these elements, as well as when solving other issues not mentioned above, except for footnotes, it is recommended to adhere to the rules set out in the document of Springer Nature **Key Style Points**, which is available on the page of the website of this publisher: https://dam.springernature.com/file/1iVex7Gr46Q8xLzdF9RNhT/*/Key+Style+Points_Dec_24.pdf?authcred=Q29weVVSTDpDMHB5X1VSTA.

3.3.3 Footnotes, if any, should be numbered. They should be typed in Times New Roman 10 font, line spacing “single”, aligned to the width (left and right edges) of the page.

Informal Knowledge Management at the Nuclear Safety Department, Swedish Technical Academy (KTH). Memorial Notes

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In the beginning of 2007, I spent three months at the Nuclear Safety Department of Swedish Technical Academy (KTH) within the 6th FP (Framework Program) SARNET (Severe Accident Research Network). That time leading professor was Prof. Truc Nam Dinh, who came from Idaho National Labs from USA, but I met there also Prof. Emeritus Bal Raj Sehgal, who has recently retired, but still was very active. I knew him three years before, during a project for Kozloduy NPP in Bulgaria, for which he has been the main consultant. That time he (together with T.N. Dinh) established a vulnerability of WWER-1000 design toward severe accidents – it became clear that the reactor pressure vessel (RPV) will breach due to high more than critical heat flux at some point (angle ~73 deg. measured from the lowest point of RPV), but also when spreading onto the reactor cavity, the melt would penetrate very quickly in the holes for the ionizing cameras situated around the reactor pit, thus bypassing the containment and creating a big radiological risk. This was at that time a very revolutionary statement, as nobody until that moment has thought about these problems. It activated a long program for taking measures against the early bypass and finally we found a solution how to plug the channels of ionization cameras with high-temperature resistant ceramics leaving at the same time the functionality of the ionizing cameras (which measure the neutron flux during reactor operation); this solution was also patented, I reported it at the post-Fukushima conference of IAEA in 2014¹ in Vienna and the Russian colleagues were very intrigued. An article concerning this solution is available on my ResearchGate page²

So, when I came in Stockholm, Prof. Sehgal introduced me to my leading professor T. N. Dinh, whom I knew by reputation from the reports for above mentioned project. T. N. Dinh was famous also to have participated in the substation of the in-vessel melt rotation strategy and device of AP-1000 – a project that eventually will be realized next years in Kozloduy, as units 7&8. A week passed and once (it was Thursday) Prof. Sehgal told me “Don’t forget that tomorrow we have fishing”. I thought: “What kind of fishing we’ll make, outside is -11°C, ice covers even the sea, shall we dig a hole in this ice to catch fishes?”. But next day it became clear, that “fishing” means an informal seminar for fishing ideas, organized by Raj. The atmosphere of this seminar was very friendly and informal – everybody could express his ideas,

¹IAEA Report on severe accident management in the light of the accident at the Fukushima Daiichi nuclear power plant international experts meeting Vienna, 17–20 March 2014, p. 31. https://www-pub.iaea.org/MTCD/Publications/PDF/IEM-7_web.pdf.

² Popov D and Yurukov V (2007) Prevention of early containment melt-through during severe accident on WWER-1000, B-320 light water reactor. <https://www.researchgate.net/profile/Dimitar-Popov-3?pubType=article>.

not only scientific ones, but just tell a story from his life, impressions or thoughts – absolute freedom, first time I saw such a thing. I understood that this is a kind of brain storming, not oriented to resolving some concrete problem, but just collecting ideas – for the profit of everyone attending the seminar. This “fishing” seminar was held, as I remember, every second Friday afternoon. There I met some remarkable people, for instance Laszlo Fuchs (from Hungarian origin), who was appointed later as professor in Fluid Mechanics at KTH and who was told to be attendant in the discovering of radioisotopes from Chernobyl accident. By the way, prof. Sehgal, who used to work in USA in 1979 (EPRI and ANL) was told to be called by the governor of Pennsylvania during TMI (Three Mile Island) nuclear accident due to an urgent request by US President Jimmy Carter, to consult by phone the nuclear operators in real time during the accident (later he has been officially included in some sub-commission to investigate the debris in the reactor of TMI, according to some publications).

At one of these seminars, I shared my thought that we need an investigation of the criticality on fast neutrons of the melt during in-vessel phase of a severe accident of LWR (Light Water Reactor). The reason was that in some experiments RASPLAV performed in Russia, at Sosnovyi Bor Labs with the help of OECD (here Raj has played a crucial role to assure financing), it was found that during experimental melting a mixture of UO_2 and ZrO_2 , a pure uranium metal has been formed. My thought was, that Plutonium-239 also can be formed in a reactor fuel melting and together with Uranium-235, they can eventually form a critical mass (what deserved investigation by modelling and calculations). To be honest, the whole auditory was very skeptic on this issue and solely prof. Sehgal supported me. He assured two weeks calculation time of the server of KTH and one doctorand from the neutron physics department to help me with the neutronic and thermochemical calculations, taking as a base WWER-1000 parameters, for which I had data available. As a result, applying several codes like MCNP (Monte Carlo N-Particles), Thermocalc and ASTEC (for thermos-hydraulic calculations of severe accidents), we found out that critical mass of pure heavy metals cannot be formed at the bottom of the reactor during full melting of the fuel. I reported this result at one conference of ENS (European Nuclear Society) in Marseille in 2009 and later made a publication in BgNS Transactions. The publication is available on my ResearchGate page as well³. Thus, the question about the recriticality of the melt (and debris) of LWR was totally closed, as all the results from other investigations on slow neutrons and now on fast neutrons have shown to be negative ones (negative coefficient of neutron multiplication Keff in all cases).

My thought is, that at KTH I met such a prominent people and I could learn from “first hand” from them to a freedom and independence of thinking (what was no very spread during socialistic and post-socialistic times of my youth). I realized also, that the centers of scientific investigations can move from one place to another place in the world, depending of the human intellectual forces concentrated there – what has been done from prof. Sehgal (who was married for a Swedish women): at KTH he has created from a scratch an excellent international team of mostly young theoretical researchers and experimentalists, who made prominent discoveries, especially in the field of the melt and debris cooling during severe nuclear accidents, and have developed original computational codes for these purposes.

³ Popov D and Runevall O (2016) Numerical investigation of the possibility for “dry” recriticality of the molten corium during late in-vessel phase of severe accident at LWR. <https://www.researchgate.net/profile/Dimitar-Popov-3?pubType=article>.