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**Datasheet for the decision  
of 31 March 2022**

**Case Number:** T 2361/18 - 3.5.07

**Application Number:** 03255772.0

**Publication Number:** 1400905

**IPC:** G06F17/50

**Language of the proceedings:** EN

**Title of invention:**

Method and apparatus for adaptively determining weight factors within the context of an objective function

**Applicant:**

Global Nuclear Fuel-Americas, LLC

**Relevant legal provisions:**

EPC Art. 123(2)  
EPC R. 103(4)(c)

**Keyword:**

Amendments - extension beyond the content of the application as filed (yes)  
Reimbursement of appeal fee (yes)

**Decisions cited:**

T 0853/16

**Catchword:**

If a request for oral proceedings is withdrawn after a date for oral proceedings has been set but before the notification of a communication issued in preparation for the oral proceedings, the withdrawal occurs "within one month of notification" for the purpose of Rule 103(4)(c) EPC.



**Beschwerdekammern**  
**Boards of Appeal**  
**Chambres de recours**

Boards of Appeal of the  
European Patent Office  
Richard-Reitzner-Allee 8  
85540 Haar  
GERMANY  
Tel. +49 (0)89 2399-0  
Fax +49 (0)89 2399-4465

Case Number: T 2361/18 - 3.5.07

**D E C I S I O N**  
**of Technical Board of Appeal 3.5.07**  
**of 31 March 2022**

**Appellant:** Global Nuclear Fuel-Americas, LLC  
(Applicant) 3901 Castle Hayne Road  
Wilmington,  
North Carolina 28401 (US)

**Representative:** Richardt Patentanwälte PartG mbB  
Wilhelmstraße 7  
65185 Wiesbaden (DE)

**Decision under appeal:** **Decision of the Examining Division of the  
European Patent Office posted on 30 April 2018  
refusing European patent application No.  
03255772.0 pursuant to Article 97(2) EPC**

**Composition of the Board:**

**Chair** J. Geschwind  
**Members:** C. Barel-Faucheux  
R. de Man

## **Summary of Facts and Submissions**

- I. The appellant (applicant) filed an appeal against the decision of the examining division refusing European patent application No. 03255772.0, published as EP 1 400 905 A1.
  
- II. The decision was taken according to the state of the file, as requested by the appellant in its letter dated 26 March 2018, and referred to a communication dated 8 December 2017 accompanying a summons to oral proceedings.  
  
In said communication, the examining division stated, *inter alia*, that the amended sole claim filed with a letter dated 28 April 2010 introduced subject-matter extending beyond the content of the application as filed, contrary to the requirements of Article 123(2) EPC.
  
- III. With its statement of grounds of appeal, the appellant maintained the sole claim considered in the contested decision.
  
- IV. The board summoned the appellant to oral proceedings scheduled to take place on 14 December 2021.
  
- V. By letter dated 24 February 2021, the appellant announced that it would not attend the scheduled oral proceedings but requested a decision based on the state of the file. It also withdrew its request for oral proceedings.
  
- VI. The board then cancelled the oral proceedings.

- VII. The appellant's final requests were that the decision under appeal be set aside and that a patent be granted on the basis of the sole claim considered in the contested decision.
- VIII. Claim 1 of the sole request reads as follows:  
"A nuclear reactor including a reactor core and means for optimizing core parameters selected from rod patterns, core flow, and sequence intervals, the means for optimizing comprising a computer system operable to adaptively adjust an objective function for providing a figure of merit for a proposed solution to satisfy a constraint or constraints, the computer system comprising processor means (14) operable to:  
determine a value for each penalty component of the objective function, each penalty component including a penalty term multiplied by a weight factor from a first set of weight factors, the objective function including at least two penalty components and at least one credit component, each credit component including a credit term multiplied by a weight factor;  
determine a worst penalty component using the determined penalty and credit component values; and  
characterized in that the processor means (14) is further operable to:  
increase the weight factor corresponding to the determined worst penalty component;  
decrease the weight factor corresponding to the at least one other penalty component; and  
control the reactor during an operating cycle in accordance with the optimized core parameters."
- IX. The appellant's arguments, where relevant to the decision, are discussed in detail below.

### **Reasons for the Decision**

1. *The application*

1.1 The application relates to adaptively determining weighting factors within the context of an objective function for handling optimality conditions and constraints within an optimisation search. The objective function is defined as a sum of credit and penalty components. The credit components represent the optimality conditions for the problem. The penalty components represent the constraint violations for the problem. Initially, each component is made up of a weight multiplied by a mathematical expression that quantifies either an optimality condition or a constraint violation (description, page 5, first paragraph). The adjustments to the weighting factors are performed during the course of the optimisation search (page 5, third paragraph).

1.2 In the application, a first example is given of an air-conditioning system for which the optimisation problem is to minimise the average air temperature within a room (paragraph bridging pages 7 and 8). A second example is also given of the optimisation problem of a boiler water reactor core design (page 10, second full paragraph). A processor runs a simulated operation and generates a simulation result for each input-parameter set of values, which may include placement of fresh and exposed fuel bundles within the reactor, selection of the rod groups (or "sequences") and placement of the control rod positions within the groups as a function of time during the cycle, core flow as a function of time during a cycle, reactor coolant inlet pressure, etc.(page 12, section "Optimization using the Objective Function"). Other examples are mentioned in the description such as "pressurized water reactor core

design, transportation scheduling, resource allocation, etc." (page 6, last paragraph).

*Claim 1 of the sole request*

2. *Added subject-matter (Article 123(2) EPC)*

2.1 In its decision, the examining division stated that there was no support in the application as originally filed, in particular in the final paragraph of page 10 and the second paragraph of page 11 indicated as basis for the amendments by the appellant in its letter of 28 April 2010, for the feature a "nuclear reactor including a reactor core and means for optimizing core parameters [...], the means for optimizing comprising a computer system".

2.2 The board notes that, throughout the application, the expression "reactor core" is only used as embedded in the text "reactor core design" (paragraphs [0014], [0015], [0025], [0027], [0030], [0039] and [0042] of the published application; claim 4 as originally filed); indeed, it is the design of a reactor core that is considered in the application.

2.3 Moreover, there is no basis in the application as filed for a nuclear reactor including "means for optimizing core parameters [...], the means for optimizing comprising a computer system".

2.3.1 The processor 14 - running for example a simulated operation of a boiler water reactor core - together with the memory 16 and the Graphical User Interface (GUI) 12 illustrated in Figure 1 of the application might be seen as "a computer system" of "means for optimizing core parameters" (see Figure 1 and its

description, from page 9, second full paragraph, to page 10, first full paragraph; see also the GUI illustrated by Figures 2 and 3 and their corresponding description, from page 10, second full paragraph, to page 12, first full paragraph).

- 2.3.2 The optimisation process, for a boiler water reactor core design for example, is illustrated by Figure 4 and comprises steps for performing adaptation of credit and penalty weights as illustrated by Figure 5 (page 12, second full paragraph, to page 15, second full paragraph).
- 2.3.3 But the application does not disclose that these "means for optimizing core parameters [...], the means for optimizing comprising a computer system" are included in a nuclear reactor.
- 2.3.4 The appellant referred to the passage describing Figure 2, discussed above, but also indicated claim 4 as originally filed as a basis for the amendment.

Claim 4 as originally filed refers to the method of claim 1 and stipulates that "the constraint problem relates to one of a boiling water reactor core design and a pressurized water reactor core design". Hence, this claim cannot serve as a basis for a "nuclear reactor including a reactor core and means for optimizing core parameters [...], the means for optimizing comprising a computer system".

- 2.3.5 Therefore, claim 1 does not fulfill the requirements of Article 123(2) EPC.



3. *Partial reimbursement of the appeal fee*

3.1 In the present case, the appellant withdrew its request for oral proceedings after the board had issued the summons to oral proceedings but before notification of a communication issued in preparation for the oral proceedings. According to Rule 103(4)(c) EPC, the appeal fee is to be reimbursed at 25% if any request for oral proceedings is withdrawn "within one month of notification" of a communication issued by the board in preparation for the oral proceedings, and no oral proceedings take place. The question therefore arises how "within one month of notification" is to be understood.

3.2 A similarly worded condition is present in Rule 103(3)(a) EPC, which stipulates that the appeal fee is to be reimbursed at 50% if the appeal is withdrawn, if a date for oral proceedings has been set, within one month of notification of a communication issued by the board in preparation for the oral proceedings. Points 72 and 74 of the explanatory remarks in CA/80/19 explain that this condition is intended to set an "end point" for the withdrawal of the appeal, meaning that the reimbursement possibility under Rule 103(3)(a) EPC "is available up to" the expiry of a period triggered by the notification of the mandatory communication under Article 15(1) RPBA.

Hence, if an appeal is withdrawn after a date for oral proceedings has been set but before the notification of a communication issued in preparation for the oral proceedings, the withdrawal occurs "within one month of notification" for the purpose of Rule 103(3)(a) EPC.

3.3 Although point 84 of CA/80/19 refers to the notification of the board's communication in Rule 103(4)(c) EPC as "[t]he point at which the appellant ... should be incentivised to withdraw the request for oral proceedings", the board sees insufficient reason to treat the condition "within one month of notification" in Rule 103(4)(c) EPC differently from the corresponding condition in Rule 103(3)(a) EPC. Indeed, a "too early" withdrawal of the request for oral proceedings only makes it more likely that the board will be able to use the freed-up capacity to schedule oral proceedings in another appeal case (cf. CA/80/19, point 82).

Hence, for the purpose of Rule 103(4)(c) EPC, in the present case the request for oral proceedings was withdrawn "within one month of notification" of a communication by the board.

3.4 The board is aware of decision T 853/16, which held that reimbursement under Rule 103(2) EPC, which includes the condition "within two months of notification" of a communication indicating the board's intention to start substantive examination of the appeal, is not possible if the appeal is withdrawn before that communication is issued. However, unlike Rule 103(3)(a) and (4)(c) EPC, Rule 103(2) EPC explicitly requires the withdrawal to be "in response to" the communication (see T 853/16, Reasons 7). Moreover, unlike a communication under Rule 103(2) EPC (see T 853/16, Reasons 9), a communication issued in preparation for the oral proceedings is now mandatory under Article 15(1) RPBA 2020.

3.5 The board therefore concludes that the conditions set in Rule 103(4)(c) EPC for reimbursement of the appeal fee at 25% are complied with.

4. Since the sole request on file is not allowable, the appeal is to be dismissed.

## Order

### **For these reasons it is decided that:**

1. The appeal is dismissed.
2. The appeal fee is reimbursed at 25%.

The Registrar:

The Chair:



S. Lichtenvort

J. Geschwind

Decision electronically authenticated