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# D E C I S I O N
# of 17 August 2005

**Case Number:** T 1236/01 - 3.4.1

**Application Number:** 95304882.4

**Publication Number:** 0696032

**IPC:** G21D 3/04

**Language of the proceedings:** EN

**Title of invention:**
Transient adjusted overpower protection system

**Patentee:**
General Electric Company

**Opponent:**
Framatome ANP GmbH

**Headword:**
-

**Relevant legal provisions:**
EPC Art. 123(2), (3), 54, 56

**Keyword:**
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**Decisions cited:**
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**Catchword:**
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Beschwerdekammern | Boards of Appeal | Chambres de recours

**Case Number:** T 1236/01 - 3.4.1

# D E C I S I O N
**of the Technical Board of Appeal 3.4.1**
**of 17 August 2005**

**Appellant:** (Opponent)
Framatome ANP GmbH
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D-91058 Erlangen (DE)

**Representative:**
Tergau & Pohl Patentanwälte
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D-90482 Nürnberg (DE)

**Respondent:** (Proprietor of the patent)
General Electric Company
1 River Road
Schenectady, NY 12345 (US)

**Representative:**
Tomlinson, Edward James, et al
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**Decision under appeal:**
**Decision of the Opposition Division of the European Patent Office posted 14 September 2001 rejecting the opposition filed against European patent No. 0696032 pursuant to Article 102(2) EPC.**

**Composition of the Board:**

**Chairman:** B. J. Schachenmann
**Members:** G. Assi
H. K. Wolfrum

## Summary of Facts and Submissions

I. The appellant (opponent) lodged an appeal, received on 13 November 2001, against the decision of the opposition division, dispatched on 14 September 2001, rejecting the opposition against the European patent No. 0 696 032 (application number 95304882.4). The appeal fee was paid on 13 November 2001. The statement setting out the grounds of appeal was received on 12 January 2002.

II. The opposition had been filed against the patent as a whole and was based on the grounds pursuant to Article 100(a) EPC that the subject-matter of the patent was not patentable within the terms of Articles 52(1), 54 and 56 EPC.

In the decision under appeal, the opposition division held that the grounds for opposition did not prejudice the maintenance of the patent unamended, having regard to the following document among others:

(D1) US-A-3 979 255;

(D3.1) W. Aleite *et al.*, "*Protection Limitation Systems*", American Nuclear Society, Topical Meeting on Thermal Reactor Safety, 7-11 April 1980, Knoxville, Tennessee, USA, pages 1-7;

(D3.2) W. Aleite *et al.*, "*(Protection) Limitation Systems*", American Nuclear Society, Topical Meeting on Thermal Reactor Safety, 7-11 April 1980, Knoxville, Tennessee, USA, pages 1-8;

(D4) W. Aleite, "*Improved Safety and Availability by Limitation Systems*", European Nuclear Society, International Meeting on Nuclear

Power Reactor Safety, 16-19 October 1978, Brussels, Belgium, pages 1-12.

III. With the statement setting out the grounds of appeal, the appellant filed the following further document:

(D12) Siemens AG, prospectus having the title "*Prozeßinformationssystem für Kraftwerke PRINS/PRISCA*", pages 1 and 2, and
Siemens AG, 2 prospectuses having the title "*Laständerungen, 1 Versuch D100-402/403 am 31.01.1989*".

IV. Oral proceedings were held on 17 August 2005. As announced in writing by a letter dated 20 July 2005, the appellant was not present.

V. The appellant requested in writing that the decision under appeal be set aside and the patent be revoked.

The respondent (proprietor of the patent) requested that the patent be maintained with the claims 1-6 filed during the oral proceedings and the description and drawings of the patent as granted.

VI. The wording of claim 1 according to the respondent's request reads as follows:

"*A protection system for protecting against transient overpower in a nuclear reactor, comprising:*
*means (16, 18, 20) for monitoring the operating power level of said reactor;*
*means (12, 14) for automatically adjusting a first (primary) setpoint while the operating power level is*

*in a permissible operating range to maintain said first setpoint at a first selected margin above said monitored operating power level during a planned change in said operating power level and not automatically adjusting said first setpoint during an unexpected change in said operating power level; and*
*means (16, 22) for activating systems which automatically scram (shutdown) the reactor when the level of said monitored operating power level rises unexpectedly above said first setpoint,*
*wherein said means (12, 14) for automatically adjusting the first setpoint is arranged to maintain said first setpoint at said first selected margin above said monitored operating power level during both a planned increase and a planned decrease in said operating power level.*"

Claims 2-6 according to the respondent's request are dependent on claim 1.

## Reasons for the Decision

1. The appeal is admissible.

2. *Amendments*

Claim 1 on file corresponds to claim 1 of the patent as granted with the addition of the features recited after the adverb "*wherein*". As the respondent submitted, these features are disclosed in the application as filed on page 10, lines 3-8 and 20-22. Dependent claims 2-6 correspond to claims 2-6 of the patent as granted. The description and drawings have not been

amended. Therefore, the subject-matter of the patent as amended does not extend beyond the content of the application as filed (Article 123(2) EPC). Moreover, the addition of features in claim 1 has the effect that the protection conferred has been restricted (Article 123(3) EPC).

3. *Novelty and inventive step with regard to D1*

3.1 Document D1 is considered to represent the closest state of the art. This document (see "*Summary of the invention*" bridging columns 1 and 2; Figure 1 and the corresponding description; column 4, lines 13-33) discloses a protection system for protecting against transient overpower in a nuclear reactor. The known system comprises:

- means for monitoring the operating power level of the reactor;
- means for automatically adjusting a variable power setpoint so as to maintain the setpoint above the monitored operating power level during both reactor start up and cool down representing planned changes in the operating power level;
- and means for automatically scramming the reactor when the level of the monitored operating power level rises unexpectedly above the setpoint.

The known system, in particular the power setpoint adjusting means, operates according to a tracking and holding principle (see column 5, lines 44-61) wherein the variable power setpoint automatically tracks the reactor power in the uncritical downward direction during cool down (tracking) but is held fixed and not allowed to vary with the reactor power in the critical

upward direction during start up unless an independent authorisation is given (holding). In a graphic representation of power versus time, which *mutatis mutandis* would correspond to Figure 1 concerning primary coolant pressure versus time, the setpoint during cool down would be represented by a line above and parallel to the power cool down line whereas the setpoint during start up would have a stepwise shape, the vertical portions corresponding to the authorisations to increase given by a reactor operator or automatic means such as a time clock.

Moreover, the power setpoint adjusting means is such that the setpoint is not automatically adjusted if the operating power level unexpectedly increases during a planned cool down (see Figure 2 and the corresponding description). In this situation, the adjusting means will hold the cool down setpoint value until a scram is initiated when the unexpectedly increasing power level reaches that value.

3.2 Hence, in view of the foregoing, the subject-matter of claim 1 differs from the protection system according to document D1 in that the claimed setpoint adjusting means is arranged to maintain the setpoint at a selected margin above the monitored operating power level not only during a planned decrease but also during a planned increase in the operating power level.

3.3 At the oral proceedings, the respondent took the view that the power levels according to the start up and cool down lines shown in Figure 1 of D1 should not be considered as belonging to the "*permissible operating*

*range*" of the reactor within the meaning of claim 1 on file.

Apart from the fact that claim 1 does not define the limits of such a "*permissible operating range*", no difference between the claimed subject-matter and the teaching of D1 can be seen in this respect. Indeed, although a line represents the "*normal operation*" of the reactor in Figure 1 of D1, the skilled person would understand that this line corresponds to the full power operation of the reactor. Operations at lower power levels, however, are not only possible but also quite usual. In the context of D1, they would then correspond to the upper parts of the start up and cool down lines to be considered as belonging to the permissible operating range of the reactor. This feature cannot, therefore, distinguish claim 1 from the disclosure of D1.

3.4 The above identified difference between the protection systems according to claim 1 under consideration and document D1 avoids the disadvantages related to a stepwise variation of the setpoint during planned increases of the reactor power, which consist in that a number of independent authorisations is needed and, moreover, the safety level is not constant during the whole planned increase in the operating power level. The stepwise shape is characterised by edges corresponding to the times when the setpoint value is allowed to increase. In each of these times, there is the risk that the setpoint is at a relatively small margin above the monitored operating power level. In such a situation, minor and harmless upward excursions

in the power level could lead to an undesired reactor scram.

3.5 To replace, during a planned increase in the power level, the known stepwise variation of the setpoint by a setpoint tracking the line of the monitored power level with a selected upward margin is not an obvious measure. First, the teaching of D1 does not give any hint at such a replacement. The skilled person, who wishes to avoid the above mentioned disadvantages, would rather consider a stepwise shape in which the number of steps is sufficiently high to reduce the variation of the margin between the setpoint and the start up line while, at the same time, avoiding the need for an excessively high number of independent authorisations. The skilled person, however, would not have any incentive to depart from the teaching of D1 concerning the provision of a stepwise varying setpoint during a planned increase in the power level. Underlying this teaching there is a protection concept based on the distinction between critical start up and uncritical cool down, i.e. planned increase and planned decrease in the operating power level. An asymmetry thus results as regards the adopted protection measures, which consist in automatic tracking the setpoint for decreasing power levels but in holding the setpoint together with the provision of independent authorisations in the opposite direction of increasing power level considered to be more critical. This asymmetry is set aside in the present invention which relies on a different protection concept. Namely, whereas an increase and a decrease in the operating power level are not distinguished from the point of view of reactor protection as far as both of them are

planned, a difference requiring different measures is seen between planned and unexpected changes. For such a new approach there is no hint in document D1, nor can it be ascribed to the skilled person's knowledge without hindsight.

3.6 In conclusion, the subject-matter of claim 1 is novel and does not result in an obvious way from document D1. In this respect, the appellant did not submit any comments either in writing before the date of the oral proceedings or orally due to its absence at the oral proceedings.

4. *Documents D3.1, D3.2, D4 and D12*

4.1 Documents D3.1 and D3.2 have the same authors and title but a different text. This casts a doubt as to which version, if any, was presented in 1980 at a Topical Meeting on Thermal Reactor Safety of the American Nuclear Society. Anyhow, no evidence was produced as to whether these documents in their given form were actually made available to the public and at which date.

4.2 Document D4 was allegedly presented in 1978 at an International Meeting of the European Nuclear Society. In this case too, no evidence was produced as to whether this document in its given form was made available to the public and at which date.

4.3 Document D12 consists of three papers from Siemens AG. Considering that Siemens AG was the former opponent in the present case, there is no justification for the late filing of this document. Moreover, no evidence was

produced regarding the date at which these papers in their given form were made available to the public.

4.4 In an annex to the summons to oral proceedings, the appellant was invited to provide evidence in this respect. However, it did not reply. For these reasons, documents D3.1, D3.2, D4 and D12 are not considered to represent a state of the art according to Article 54(2) EPC. They are disregarded.

## Order

## For these reasons it is decided that:

1. The decision under appeal is set aside.

2. The case is remitted to the first instance with the order to maintain the patent in amended form with claims 1-6 filed as only request during the oral proceedings and the description and drawings of the patent as granted.

The Registrar: The Chairman:

R. Schumacher B. Schachenmann