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D E C I S I O N
of 6 August 2001

Case Number: T 0774/95 - 3.4.1

Application Number: 85104737.3

Publication Number: 0162295

IPC: G21F 9/00

Language of the proceedings: EN

Title of invention:
Inhibition of deposition of radioactive substances on nuclear power plant components

Patentee:
Hitachi, Ltd.

Opponent:
Siemens AG
ASEA BROWN BOVERI AB

Headword:
-

Relevant legal provisions:
EPC Art. 123(2)

Keyword:
"Added subject-matter (yes)"

Decisions cited:
-

Catchword:
-

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Case Number: T 0774/95 - 3.4.1

D E C I S I O N
of the Technical Board of Appeal 3.4.1
of 6 August 2001

Appellant: (Proprietor of the patent)
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Respondents: (Opponent 01)
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(Opponent 02)
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Representative:
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Decision under appeal: **Decision of the Opposition Division of the European Patent Office posted 17 July 1995 revoking European patent No. 0 162 295 pursuant to Article 102(1) EPC.**

Composition of the Board:

Chairman: G. Davies
Members: M. G. L. Rognoni
H. K. Wolfrum

Summary of Facts and Submissions

I. The appellant (patentee) lodged an appeal, received on 11 September 1995, against the decision of the opposition division, despatched on 17 July 1995, revoking the European patent No. 162 295. The fee for the appeal was paid on 11 September 1995 and the statement setting out the grounds of appeal was received on 24 November 1995.

II. Both the respondent 01 (opponent 01) and the respondent 02 (opponent 02) had filed oppositions against the patent as a whole on the basis of Article 100(a) EPC.

III. In the decision under appeal, the opposition division held that claims 1 according to the main and the auxiliary requests filed in the opposition proceedings were admissible under Article 123(2) and (3) EPC, but that the subject-matter of claim 1 according to the main request was not novel and that claim 1 according to the auxiliary request did not involve an inventive step, having regard to the cited prior art.

IV. With the grounds of appeal, the appellant submitted new claims 1 to 3 by way of main request and a new claim 1 by way of auxiliary request.

V. In response to the grounds of appeal filed by the appellant, the respondent 02 raised, *inter alia*, objections concerning the admissibility under Article 123(2) EPC of the appellant's requests.

VI. Both the appellant and the respondent 02 filed a request for oral proceedings.

VII. In a communication annexed to a summons to oral proceedings, the Board expressed, *inter alia*, the preliminary opinion that claim 1 of the main request and claim 1 of the auxiliary request did not appear to be admissible under Article 123(2) EPC.

VIII. With a letter dated 5 February 2001 the appellant withdrew the request for oral proceedings.

IX. With a letter dated 12 February 2001, the Registry of the Board informed the parties that the oral proceedings due to take place on 28 February 2001 had been cancelled.

X. The appellant requested that the decision of the opposition division be set aside and a patent be granted on the basis of:

Main request
claims 1 to 3 as filed with the grounds of appeal,
claims 4 to 6 of the patent specification , and a description to be adapted;

Auxiliary request
claim 1 as filed with the grounds of appeal
claims 2 to 6 as for the main request, and a description to be adapted.

The respondents 01 and 02 requested that the appeal be dismissed.

XI. The wording of claim 1 according to the **main request** reads as follows:

"1. A process for inhibiting deposition of radioactive

substance on components of a nuclear power plant comprising a reactor (1), connected thereto a turbine (2) and a hot well (3), and a low pressure condensed water pump (4), a demineralizer (5) for condensed water and a supplying water heater (8) connected in series from the hot well (3) and returned partly to the hot well while partly connected to the reactor (1) and partly to a demineralizer (9) for reactor cleaning system which is in turn connected to the reactor (1), said process comprises forming on surfaces of components, contacting with nuclear reactor cooling water containing radioactive substances, a positively charged iron oxide film, wherein the iron oxide film further comprises metallic elements giving polyvalent cations, by treating the surfaces of the components with a solution having a temperature of 150 to 300 °C and containing polyvalent metal cations and anions having a lower valence number than the cations at a time of forming the iron oxide film or after the formation of the iron oxide film poured from a pouring apparatus (6a, 6b) positioned in a down stream of the demineralizer (5) for condensed water and/or a down stream of the supplying water heater (8),
or with a solution wherein a metal plate is placed which can release polyvalent metal cations, said solution having a temperature of 150 to 300 °C and containing anions having a lower valence number than said polyvalent metal cations, wherein the polyvalent metal cations are at least one member selected from the group consisting of Al^{3+}, Fe^{3+}, Ba^{2+}, Ca^{2+}, Mg^{2+}, Pb^{2+}, Zn^{2+} and Cu^{2+}, in a concentration of 3 ppb to 1000 ppm, and the anions are at least one member selected from the group consisting of HCO_3^-, $H_2PO_4^-$, MnO_4^-, NO_2^-, NO_3^-, OH^-, $HCOO^-$, CH_3COO^-, MoO_4^{2-}, HPO_4^{2-}, SO_4^{2-} and WO_4^{2-}."

Claim 1 of the **auxiliary request** differs from claim 1 of the **main request** only in that the concentration range of polyvalent cations is limited to "50 ppb to 1000 ppm".

XII. The appellant made no submissions in response to the Board's communication, or to the objections under Article 123(2) EPC raised by the respondent 02.

The respondent 01 made no submissions relating to the admissibility under Article 123(2) EPC of the appellant's requests.

The respondent 02 essentially argued that claim 1 of the main request and claim 1 of the auxiliary request covered subject-matter which extended beyond the content of the application as originally filed and that, therefore, such requests were not admissible under Article 123(2) EPC.

Reasons for the Decision

1. The appeal is admissible.

Admissibility under Article 123(2) EPC

2.1 According to the respondent 02, claim 1 of the main request and claim 1 of the auxiliary request infringe Article 123(2) EPC, *inter alia*, for the following reason:

The expression "to place a metal in a solution" in the contested patent made sense only in the context of

placing the metal plate as a sacrificial anode in the condensate hot well, as specified on page 14, lines 56 and 57 of the patent specification. However, a metal plate in the water of the cooling circuit could not bring about a solution comprising the anions specified in the list recited in the granted claim 1. In fact, the cooling water was supposed to be pure water and, as such, could supply only OH-anions.

2.2 According to the application as originally filed (page 34, last paragraph), the "pouring of the polyvalent metal cations" into the primary cooling water of a nuclear power plant "can be replaced by placing a metal that can release polyvalent metal cations in **a solution**" (emphasis added). The only examples given in the application (cf. page 34, lines 8 to 14) relate to a zinc, magnesium or aluminum plate placed as a sacrificial anode in a condensate hot well and, therefore, merely imply solutions containing Zn^{2+}, Mg^{2+} or Al^{3+} cations and **OH^- anions.** Claim 1 of both requests, however, specifies, *inter alia*, the treatment with a solution "wherein a metal plate is placed which can release polyvalent cations", whereby the solution contains anions having a lower valence than the polyvalent cations, and the cations and anions are defined as follows:

(a) "the cations are at least one member selected from the group consisting of Al^{3+}, Fe^{3+}, Ba^{2+}, Ca^{2+}, Mg^{2+}, Pb^{2+}, Zn^{2+}, Cu^{2+}", and

(b "the anions are at least one member selected from the group consisting of HCO_3^-, $H_2PO_4^-$, MnO_4^-, NO_2^-, NO_3^-, OH^-, $HCOO^-$, CH_3COO^-, MoO_4^{2-}, HPO_4^{2-}, SO_4^{2-}, and WO_4^{2-}".

Hence, most of the combinations of an unspecified metal plate with certain cations and anions covered by the independent claims of the appellant's requests are neither explicitly nor implicitly disclosed in the application as originally filed.

3. For the above reasons, the Board finds that neither claim 1 of the main request nor claim 1 of the auxiliary request is admissible under Article 123(2) EPC. Hence, none of the appellant's requests can form the basis of a patent maintained in amended form.

Order

For these reasons it is decided that:

The appeal is dismissed.

The Registrar: The Chairman:

R. Schumacher G. Davies