



**PATENTS ACT 1977**

BETWEEN

Adamson Jones IP Limited

Claimant

and

American Isostatic Presses Inc

Defendant

PROCEEDINGS

Application under section 72 for the revocation of patent EP2856472B3

HEARING OFFICER

Phil Thorpe

Mr Nicholas Ferrar of Adamson Jones IP Limited, appeared for the claimant

Ms Maeve O'Flynn of Finnegan Europe LLP, appeared for the defendant

Hearing date: 10 November 2022

**DECISION**

**Introduction**

- 1 Patent number EP2856472B1 was granted to American Isostatic Presses Inc (“the defendant”) on 27<sup>th</sup> August 2017. The patent stems from a PCT application PCT/US2013/044055, which was published as WO2013/184648 A1, and has a filing date of 4<sup>th</sup> June 2013. WO2013/184648 A1 claims priority from US application no. 13/488,376 (published as US2013/0109903 A1).
- 2 On 30<sup>th</sup> June 2021, Adamson Jones IP Limited (“the claimant”) made an application to the comptroller under section 72 of the Patents Act 1977 (“the Act”) for revocation of the patent on the grounds that the invention claimed is neither novel nor does it involve an inventive step over (alleged) prior art. Furthermore, the claimant argued the patent was not entitled to its priority date.
- 3 On 31<sup>st</sup> August 2021 the defendant filed a counterstatement. The defendant also filed a limitation request at the European Patent Office (“EPO”) on the 27<sup>th</sup> August 2021 to amend the claims of the granted patent. On the 27<sup>th</sup> January 2022 a letter was issued from the EPO allowing the request, and a new patent specification EP2856472B3 was published on 23<sup>rd</sup> February 2022.

- 4 The claimant filed an amended statement on 7<sup>th</sup> April 2022 regarding grounds for revocation of the amended patent. The claimant submitted that the invention claimed in the amended patent is neither novel nor does it involve an inventive step over (alleged) prior art, and that it is insufficient. Furthermore, the claimant maintained that the patent was not entitled to its priority date.
- 5 In response the defendant filed an amended counterstatement. The matter came before me for a hearing on 10<sup>th</sup> November 2021. The claimant was represented by Mr Nicholas Ferrar of Adamson Jones IP Limited. The defendant was represented by Ms Maeve O'Flynn of Finnegan Europe LLP. Both sides provided skeleton arguments in advance of the hearing for which I am grateful.

### **The Law**

- 6 The comptroller's powers to revoke a patent on the application of another person are set out in section 72(1) of the Patents Act 1977, the relevant part of which read as follows:

*72.-(1) Subject to the following provisions of the Act, the court or the comptroller may by order revoke a patent for an invention on the application of any person ... on (but only on) any of the following grounds, that is to say –*

*(a) the invention is not a patentable invention;*

*(b) ...*

*(c) the specification of the patent does not disclose the invention clearly enough and completely enough for it to be performed by a person skilled in the art;*

*(d) ...*

- 7 An invention is patentable if it meets the conditions set out in section 1(1) of the Act, namely that the invention is new, it involves an inventive step, it is capable of industrial application and is not excluded.
- 8 Sections 2 and 3 of the Act define what is meant by “new” and “inventive step” respectively. Section 2 states that an invention shall be taken to be new if it does not form part of the state of the art and goes on to define the state of the art as comprising anything made available to the public before the priority date of the invention. Section 3 states that an invention shall be taken to involve an inventive step if it is not obvious to a person skilled in the art.

### **The granted patent (as amended)**

- 9 The patent, as amended in the B3 specification published on the 23<sup>rd</sup> February 2022 (hereinafter referred to as “the patent”), relates to methods of consolidating radioactive materials by “hot isostatic pressing” (HIP).
- 10 Liquid radioactive wastes can be processed to form a small, granular solid calcine having consistency similar to laundry detergent. This calcinated material provides a safer product for storage while reducing the volume of stored waste. HIP consists of a pressure vessel surrounding an insulated resistance-heated furnace. Treating the

radioactive calcine material with the HIP involves filling a stainless steel can with the calcine and additives. The can is evacuated, sealed and placed into the HIP furnace and the vessel is closed, heated, and pressurized. The combination of heat and pressure consolidates and immobilizes the waste into a dense monolith. The can may optionally be put in a secondary containment vessel referred to as an "Active Containment OverPack (ACOP)" before being placed in the HIP furnace.

- 11 The inventors have found that by loading the sealed can through the bottom of a HIP vessel using a fully automated system, the cans can be pre-heated and loaded while hot. This allows for a decrease in process time by as much as 1/3 or even 1/2. For example, the cans can be pre-heated and loaded while at temperatures up to 600°C.
- 12 The patent has fourteen claims, with a single independent claim 1 which is reproduced below:

*A method of consolidating a calcined material comprising radioactive material by hot isostatic pressing HIP, said method comprising:*

*mixing a radionuclide containing calcine with at least one additive to form a pre-HIP powder;*

*loading the pre-HIP powder into a can;*

*sealing the can;*

*loading the sealed can into a HIP vessel;*

*closing said HIP vessel; and*

*hot-isostatic pressing the sealed can within the HIP vessel;*

*the method being characterised by:*

*loading the sealed can through a bottom of the HIP vessel, wherein loading the can through the bottom of the HIP vessel includes using at least one robot of an automated loading system; and*

*hot-isostatic pressing the sealed can within the HIP vessel at a temperature ranging from 1000 °C to 1250 °C and a pressure ranging from 30 to 100 MPa for a time ranging from 10-14 hours.*

- 13 The claimant has for ease of reference divided the claim into a number of features labelled (A)-(N):

*(A) A method of consolidating a calcined material*

*(B) comprising radioactive material by hot isostatic pressing HIP, said method comprising:*

*(C) mixing a radionuclide containing calcine with at least one additive to form a pre-HIP powder;*

- (D) loading the pre-HIP powder into a can;*
- (E) sealing the can;*
- (F) loading the sealed can into a HIP vessel;*
- (G) wherein loading of the can through a bottom of the HIP vessel, wherein loading the can through the bottom of the HIP vessel includes using at least one robot of an automated loading system*
- (H) closing said HIP vessel; and*
- (I) hot-isostatic pressing the sealed can within the HIP vessel; the method being characterised by:*
- (J) Loading the sealed can through a bottom of the HIP vessel; and*
- (K) hot-isostatic pressing the sealed can within the HIP vessel*
- (L) at a temperature ranging from 1000 °C to 1250 °C*
- (M) and a pressure ranging from 30 to 100 MPa*
- (N) for a time ranging from 10-14 hours.*

### **Claim construction**

- 14 Before I can consider the validity of the patent, I must first construe the claims. This means interpreting the claims in the light of the description and drawings as instructed by section 125(1). In doing so I must interpret the claims in context through the eyes of the person skilled in the art. Ultimately the question is what the person skilled in the art would have understood the patentee to be using the language of the claims to mean. This approach has been confirmed in the decisions of the High Court in *Mylan v Yeda*<sup>1</sup> and the Court of Appeal in *Actavis v ICOS*<sup>2</sup>. Section 125(1) reads as follows:

*For the purposes of this Act an invention for a patent for which an application has been made or for which a patent has been granted shall, unless the context otherwise requires, be taken to be that specified in a claim of the specification of the application or patent, as the case may be, as interpreted by the description and any drawings contained in that specification, and the extent of the protection conferred by a patent or application for a patent shall be determined accordingly.*

- 15 The claimant has defined the skilled person as “a person or team tasked with implementing or improving methods of immobilising radionuclides (radioactive waste) using glass and/or ceramic based materials for long term storage thereof”. This appears to be a reasonable identification of the skilled person/team, and I note that the defendant does not appear to have explicitly offered an alternative.

<sup>1</sup> *Generics UK Ltd (t/a Mylan) v Yeda Research and Dev. Co. Ltd & Anor* [2017] EWHC 2629 (Pat)

<sup>2</sup> *Actavis Group & Ors v ICOS Corp & Eli Lilly & Co.* [2017] EWCA Civ 1671

- 16 Features A-F&H-N as referenced by the claimant were not discussed in any depth with regard to their construction at the hearing and throughout the correspondence, and I consider that they would be readily construed by the person skilled in the art. Feature G, however, requires some consideration.
- 17 Both the claimant and defendant have referred to paragraph 26 of the description which states:
- “Fully Automated System” refers to the ability to load and unload HIP cans from the HIP system using machines and control systems, including robotics, without any direct human contact.”
- 18 The claimant argues that because there are scant details of the robot and/or automated loading system and no specific apparatus or construction for loading of the HIP discussed in the patent, the term “a robot of an automated loading system” should be construed broadly as “any machine and/or control system suitable for loading/unloading HIP without any direct human contact with the Hip Vessel or can”.
- 19 Ms O’Flynn emphasised at the hearing that claim 1 specifically uses at least one robot, so the automated system of the claim has to include a robot. The defendant disagrees with the claimant’s construction noting that robotics is a *subset* of any machine and control system. The claimant’s definition of feature (G) relating to “any machine/control system” is therefore wrong as it is broader than the express definition of the specification (i.e. using machines and control systems *including* robotics). The defendant has also argued that the claimant’s broad interpretation of “at least one robot of an automated loading system” is equivalent to saying an actuator used in a power window for a car is the robot of an automated glass closure system. They add that feature (G) should not be construed to include remote operation with directed human contact.
- 20 I believe that the skilled person would in the absence of a clear definition in the description turn to the natural and ordinary meaning of the term ‘robot’ – i.e. a machine/mechanism capable of carrying out an action(s) automatically – and then look to the description and figures for context and how to interpret the feature of “at least one robot of an automated loading system”. The only discussion in the patent regarding the use of a robot is in paragraph 26 and the claim itself, and I cannot therefore see how the person skilled in the art would attach any particular/specific meaning to the term ‘robot’ based on the specification as a whole and/or the context of the patent. Nor does the statement in paragraph 26 that the machines and control systems used to load/unload HIP cans ‘include’ robotics impart any particular meaning to the term ‘robot/robotics’. The term “a robot of an automated loading system” would therefore be construed by the person skilled in the art in broad terms as a mechanism/machine of a HIP loading system which does not require human contact.
- 21 I would note that the claims should be interpreted through the eyes of the skilled person in light of the description and drawing. Equating terms such as ‘robot’ to their use/context in entirely different scenarios (such as car windows) does not assist.

### **(Alleged) Prior art**

- 22 The claimant has referred to sixteen documents (D1-D16) during correspondence. Documents D4, D5 and D6 were not discussed in any detail at the hearing or in the amended statements, and I will therefore not discuss them. Documents D1-D3 and D6-D16 are summarised as follows:

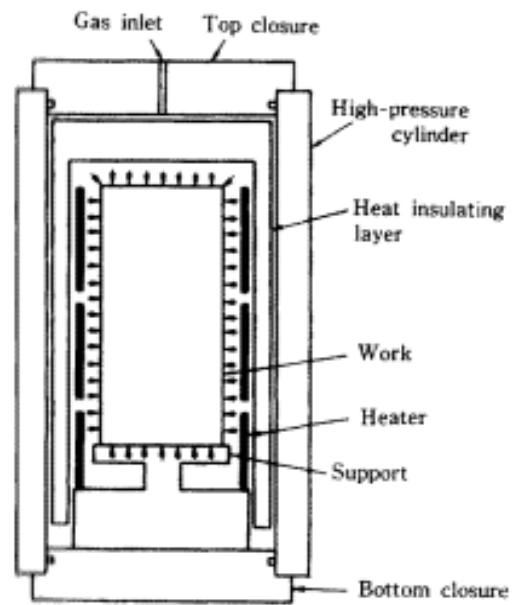
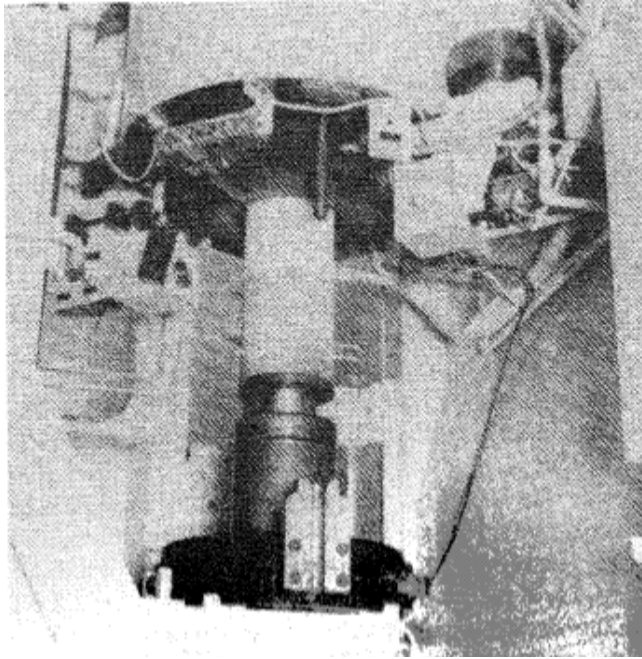
**D1: Vance E. R. et al: Advantages Hot Isostatically Pressed Ceramic and Glass-Ceramic Waste Forms Bring to the Immobilization of Challenging Intermediate- and High-Level Nuclear Wastes. Published October 2010**

- 23 D1 discusses hot isostatic pressing (HIP) in consolidating calcinated nuclear waste. In particular, pages 130-131 state:

**“Hot Isostatic Pressing.** In hot isostatic pressing of ceramics or glass-ceramics for radioactive waste immobilisation the reactive calcined waste form (waste + additives) material is in a form of near dust-free powder or granules that is first packed by vibratory means inside a relatively thin-walled metal can. This is then evacuated after welding on a lid to which is attached an evacuation tube and heated to 300-600°C for several hours to remove absorbed gases. The evacuation tube is then sealed, and the can is consolidated to full density by compressing it with several tens or even hundreds of MPa of argon gas during a further heating cycle. The use of a suitable metal container, which may be a stainless or mild steel, nickel or other metals, can help to achieve the desired redox conditions, minimise any potential deleterious reaction between the waste form and the container, and of course prevents offgas escape. So the entire process produces offgas only in the calcination stage where temperatures are much lower than those in the final consolidation (roughly the same as those used for vitrification, i.e. 1000-1200°C in most cases).....HIPing is a batch approach and cans containing more than ~ 100 kg of waste form are feasible, with a processing time of ~ 10 h.”

**D2: Koizumi, M., et al, Isostatic Pressing Technology and Application. 1991;**

- 24 D2 discusses various aspects of HIP technology. In particular, structural aspects of a HIP pressure vessel are shown in figure 4.4 (left), with a treated item being moved into/out of the pressure vessel from below, and figure 4.5 (right) showing a schematic drawing of a HIP unit. These figures are reproduced below:



25 Furthermore, page 102 states:

“Finally, the two methods for moving the treated item into and out of the treatment chamber are from above the pressure vessel and from below. In Japan the latter method is almost always used because of its great superiority both in safety and in ease of operation. One example of this method appears in Fig 4.4.”

D3: Treat, R. L., et al, Preliminary evaluation of alternative waste from solidification processes. Published April 1980

26 D3 discusses design data for various processes for the solidification and isolation of nuclear waste. In particular page H.7 states:

“The decontaminated container then passes through a cell lock to the hot-isostatic pressing cell and is placed on the bottom cover of the hot-isostatic pressing vessel. The preheated bottom cover is then transferred into position and raised to bottom-load the container into the hot-isostatic pressing vessel.”

27 Pages H24 and H25 state:

“An automated, totally integrated computerized system with instrument system redundancy may be required to obtain an acceptable level of operational safety due to the presence of radioactive material in the high-energy-level HIP. All routine operations including sequencing, timing, temperature-pressure control, interlocking, quality assurance record keeping, deviation control, system checking, and others would be programmed and automatically performed”

28 Furthermore page H.51 refers to an equipment data sheet for HIP and states:

“Design Parameters

Automatic operation; remote loading and unloading through vessel bottom;

.....

### Features

Bottom-loading Hip consists of the following major subsystem features: stainless steel clad pressure vessel;

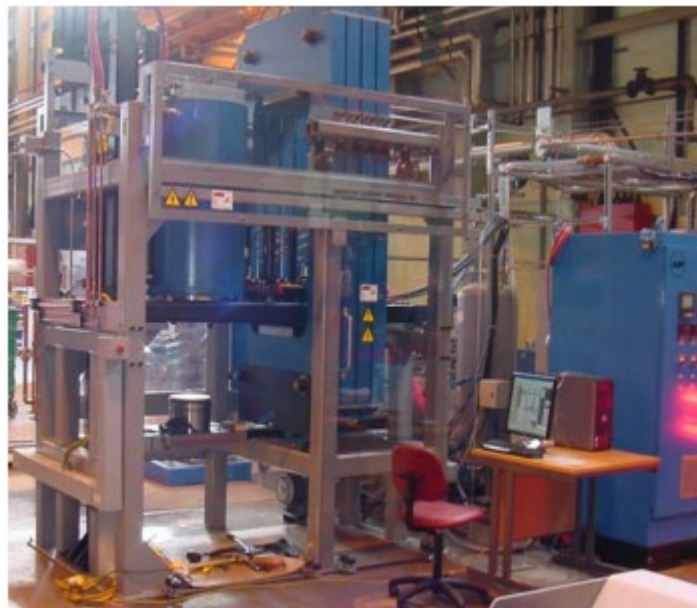
.....

### Remarks

HIP systems of this size and configuration available from Autoclave Engineers, Inc. and ASEA Inc.; considerable development efforts required to adapt to remote and radioactive process.”

D7: Stewart, M., et al Flexible Process Options for the Immobilisation of Residues and Wastes Containing Plutonium 2-6. Published September 2007;

- 29 Figure 4 of this document is reproduced below and shows a hot isostatic press installed at a Nexia facility:



- 30 Page 5 states:

“Work is underway at Nexia Solutions Workington Facility with the installation of the crushing, grinding, granulation, calcining plus a large HIP (figure 4) to demonstrate the process non-radioactively at scale.”

- 31 Furthermore, pages 6-7 state:

“Currently Nexia solutions have commenced a program for full-scale, or near full-scale demonstration of the process unit operations at Nexia’s Workington Facility. This includes the commissioning of a full-scale bottom loading HIP, which is a similar scale to the one proposed for an active line.”



D8: US provisional application No. 61/492697 published on the USPTO site on the 2<sup>nd</sup> May 2013 (due to the publication of D9)

32 D8 is provided in three sections:

“ANSTO Inc HIP Calcine Disposition Process – Request for information 1207”; pages 1-50; (referred to herein as “RFI”)

“Calcine Disposition Project Waste-Form and Technology Readiness Strategy Plan” (Document ID: PLN-3448): pages 51-110; (referred herein as “PLN”)

“Appendix A – Proprietary information to ANSTO Inc HIP Calcine Disposition Process”: pages 111-147. (Referred herein as “Appendix A”)

RFI

33 The introduction on page 7 of RFI in D8 notes that the document relates to the hot isostatic pressing (HIP) treatment option for calcines. Page 9 of RFI states:

“The process of hot isostatic pressing radioactive wastes involves a stainless steel can being filled with the calcined feed (with or without treatment additives). The can is evacuated and sealed, then placed into the HIP furnace and the vessel closed, heated and pressurized. The pressure is applied isostatically via argon gas, which at pressure, is also an efficient conductor of heat. The combined effect of heat and pressure consolidates and immobilizes the waste into a dense monolithic block sealed within the can (or work piece).”

34 The paragraph spanning pages 12-13 of RFI states:

“Calcine treatment begins with the mixing of retrieved calcine with treatment additives in a ratio of ~80:20 by weight inside a mixing vessel. The mixture is then loaded into a HIP can that is preheated and evacuated to a temperature of ~600°C prior to being sealed. An alternative option has the powder preheated prior to the can loading (these options will be evaluated as a value engineering study during the design phase). The sealed HIP cans are loaded into the HIP vessel. The HIP will process one can at a time to a temperature of ~ 1200°C at a processing pressure of ~ 30-50 MPa. The cycle time to process a HIP can is ~ 12 hours.”

35 Page 17 lines 5-10 of RFI also states:

“ANSTO Inc’s preliminary process design contains a number of elements that have been demonstrated at full scale with actual calcine, and consequently have a very high maturity level. These include pneumatic conveying of calcine powder (if required), discharge into and release from hoppers, powder blending and solids valves. Related aspects of the front-end powder handling, including can filling and sealing, are being widely employed at other nuclear facilities with a wide range of materials other than calcine.”

36 Page 35 also discusses that the weight of treated calcine per HIP can ~ 980kg.

## PLN

- 37 PLN In D8 outlines a calcine disposition project. Paragraphs 1&2 on page 27 of PLN, under the heading of 'A-8.3-Maintenance', state:

"In general, in cell equipment will be run to failure and then remotely replaced. Where routine maintenance is identified, e.g. changing seals of changing hydraulic fluid,, this will be designed for and carried out remotely, Spares will be held and a routine replacement schedule devised. For large items or those that are not expected to require routine replacement during plant life, these will be run to failure and replaced on an ad hoc basis

This is the case for all equipment located within the DMR cell, especially that equipment designed for calcine handling. This equipment will be set up to be maintained remotely."

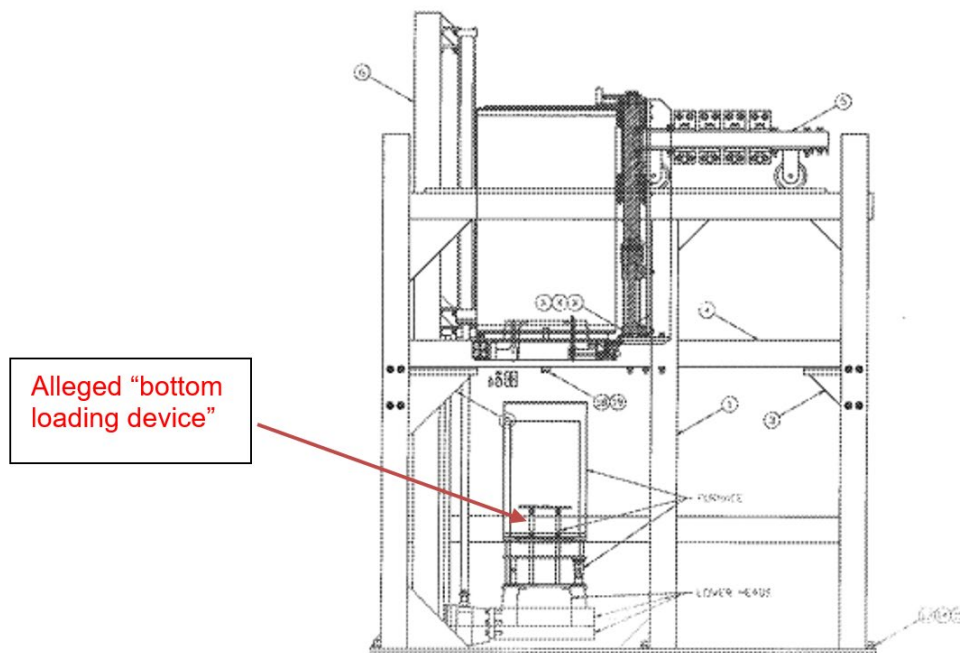
- 38 Page 52 of PLN defines systems and subsystems and lists 'remote handling and maintenance tools' and a 'can handling system'.

## Appendix A

- 39 Appendix A relates to information for the HIP calcine disposition process. Page 34 (step 14) of Appendix states:

"The HIP vessel bottom closure is in the open/lowered position. The ACOP is moved into position on the HIP vessel bottom closure. The HIP vessel bottom closure is raised and secured to seal the HIP vessel"

- 40 Page 26 of Appendix A has a diagram for a HIP process which discusses equipment including "cart/tracks", "Pick and Place Machine" and "trains A and B". Ms O'Flynn confirmed at the hearing that the diagram on page 26 of appendix A was the same (figure 2) that appeared in the Patent. Figure A-10-2 on page 31 of Appendix A refers to a "HIP loading station" and a "HIP loading handler".
- 41 The final page of Appendix A contains the following diagram of a HIP device (I have highlighted an alleged bottom loading device):



**D9:** US application no. 13/488,376, published as US 2013/0109903 on 2<sup>nd</sup> May 2013

- 42 D9 is the US application from which the patent’s PCT application claims priority. D9 discloses substantially the same subject matter as the patent. Indeed, at the hearing Ms Flynn stated that “the method as recited in claim 1 is very clearly disclosed in D9”.

**D10:** PCT application No. PCT/US2013/044055, published as WO2013/184648 on 12<sup>th</sup> December 2013

- 43 D10 is the published PCT application from which the patent stems.

**D11:** Berry, S.M at al, Conceptual Design for Remote Handling Methods Using the HIP Process in the Calcine Immobilisation Program. Published March 1994.

- 44 This document relates to a report on design philosophy for calcine immobilisation using the hot isostatic press (HIP) process. In particular, this document states at pages 4,18 (respectively):

“The highly radioactive nature of the calcine waste material requires that all movement from the storage bin vaults, pretreatment and blending, and final handling for the HIP process be accomplished using remote methods.”

“The process can must be remotely loaded into the HIP furnace due to the high radiation fields from the caline waste”

- 45 Furthermore, figure 4, which refers to an “overhead handling system”, is reproduced below:

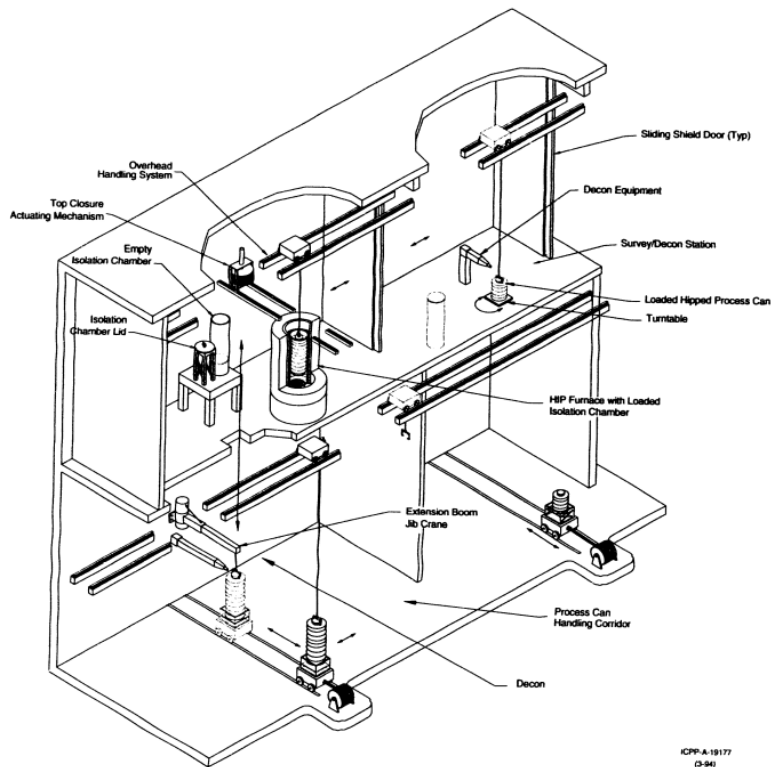


Figure 4. HIP Can Decon and HIP Processing in Top Loading Furnace

**D12: Bateman, Kenneth J et al. Hot Isostatic Pressing of Ceramic Waste from Spent Nuclear Fuel. Published April 2002**

- 46 This document discusses the HIP process and figure 10 shows cannisters loaded with irradiated material and handled by a remote manipulator arm.



**D13: E.R. Johnson Associates, Inc. Preliminary Evaluation of Alternative Waste from Solidification Processes Volume II: Evaluation of the Processes. Published August 1980**

- 47 This document relates to a report on processing nuclear high-level waste. In particular section 1.2 on page 3 and section 3.2. on page 14 state (respectively):

“The present Volume II presents assessments of these processes in the context of the feasibility of establishing practicable production-scale facilities for the

application of the processes in a highly radioactive environment, which requires remote operation and maintenance.”

“The first of these principal criteria, Complexity of Process is clearly the most crucial measure of the difficulty which may be involved in transforming a conceptual or even pilot plant operation to a successful remotely operated production system”

**D14: Japan society of Powder and Powder Metallurgy, Proceedings of the 2011 International Conference on Hot Isostatic Pressing. Published 14<sup>th</sup> April, 2011.**

- 48 This document was described by Mr Ferrar at the hearing as a “commercial brochure” and on page 1 shows a HIP system which I have reproduced below. Under ‘features’ on page 1, it also states: “bottom loading system”.



**D15: Hamilton, R L et al. Plutonium Immobilisation project – Robotic Canister Loading. Published 4<sup>th</sup> January, 2000.**

**D16: Hamilton, R L et al. Plutonium Immobilisation project – Robotic Canister Loading. Assumed publication, 2000.**

- 49 These documents discuss a project for robotic cannister loading. Figure 6, which is reproduced below, shows a mock-up for a freestanding cannister loading robot.



### **Common General Knowledge of the Person Skilled in the Art**

- 50 Before considering the validity of the patent, it is prudent to identify the common general knowledge (“CGK”) of the person skilled in the art. I have already considered, in paragraph 14 above, that the skilled person is “a person or team tasked with implementing or improving methods of immobilising radionuclides (radioactive waste) using glass and/or ceramic based materials for long term storage thereof”.
- 51 The claimant considers the skilled person’s CGK to include known methods and apparatus for processing waste in glass and/or ceramic based materials, and knowledge of the glass, ceramic and starting material compositions. Furthermore, their knowledge would include systems and apparatus to ensure the operational safety and the provide remote handling of radioactive waste. In particular, documents D11-D16 are felt to discuss well known principles in the nuclear waste processing industry and to demonstrate that the remote handling of the radioactive HIP can, and/or various other aspects of the radioactive waste processing system, would fall not only within the CGK, but be a critical requirement of their CGK. Documents D2-D7 are also felt to show and demonstrate automated processes.
- 52 More specifically the claimant considers it to be CGK to load the HIP can from the bottom of the vessel as there are commercially available machines to do so (e.g. shown in Fig 4 of D7, shown in the brochure of D14, and as discussed in D8). Furthermore, D2, D3 and D7 are felt to be examples of the CGK of a bottom loading HIP vessel. The claimant also notes that it would be a matter of CGK that manual handling of a radioactive source would not be considered.
- 53 The defendant does not consider that the detailed disclosure of the documents cited by the claimant would form part of the CGK of the skilled person. The defendant

agrees that they show that bottom loading hip systems were available at the priority date of the patent, but they do not consider that these documents establish that it was part of the CGK of the skilled person to use a bottom loading hip system in combination with using at least one robot of an automated loading system in a HIP method where that HIP method is for consolidating calcined material comprising radioactive material.

- 54 Ms O'Flynn commented in particular with respect to the 'Remarks' section on page H51 of D3 which discuss that considerable development efforts were required to adapt commercial systems to a remote and radioactive process; and page 5 of D7 which discusses that work is underway to demonstrate the process non-radioactively at scale using a large HIP (figure 4) – that just because bottom loading HIP systems were commercially available does not mean that it was part of the CGK to apply such a bottom loading HIP to the context of radioactive materials. Furthermore, just because bottom loading HIP systems existed, it does not mean that it was part of the CGK of the skilled person to apply such a system, as well as automation including a robot, in the context of radioactive materials.
- 55 Based on the documents and arguments submitted, I am satisfied that it would be CGK for the skilled person that processing a can of radioactive calcine material would need to be automated – that is readily apparent from documents D2-D7 and D11-D16, not least from a safety and practical perspective of moving a heavy can full of radioactive waste to/from a HIP vessel. The skilled person would be at least aware of mechanisms/machines to do so. I am also satisfied that the CGK would include an understanding that a can may be loaded into a HIP from either the top or bottom of a HIP vessel.

### **Effective Priority date**

- 56 The patent stems from a PCT application PCT/US2013/044055 (D10) and has a filing date of the 4<sup>th</sup> June 2013. The patent claims a priority date of 4<sup>th</sup> June 2012 from US application no. 13/488,376 (D9). D9 allegedly claims priority from a US provisional application No. 61/492697 (D8) which was filed on 2<sup>nd</sup> June 2011.
- 57 The claimant argues that, as the entire subject matter of the claims can be found in both D8 and D9, D9 is not the earliest patent application containing the subject matter. As such, the priority claim to D9 in the patent is invalid under section 5(3) of the Act.
- 58 The defendant argues that the patent's priority date of 4<sup>th</sup> June 2012 is valid as it is not clear that D8 is a "relevant application" for the purposes of section 5(3) in light of section 5(5). Furthermore, the defendant considers that the subject matter of claim 1 is disclosed in D10 and D9, but is not disclosed in D8. As a result, the invention as set out in claim 1 of the patent is entitled to the claimed priority date of 4<sup>th</sup> June 2012.
- 59 Sections 5(2A)(a), 5(3) and 5(5) respectively state:

*(2A) The (priority) periods are -*

*(a) the period of twelve months immediately following the date of filing of the earlier specified relevant application, or if there is more than one, of the earliest of them;*

(3) Where an invention or other matter contained in the application in suit was also disclosed in two earlier relevant applications filed by the same applicant as in the case of the application in suit or a predecessor in title of his and the second of those relevant applications was specified in or in connection with the application in suit, the second of those relevant applications shall, so far as concerns that invention or matter, be disregarded unless -

(a) it was filed in or in respect of the same country as the first; and

(b) not later than the date of filing the second, the first (whether or not so specified) was unconditionally withdrawn, or was abandoned or refused, without -

(i) having been made available to the public (whether in the United Kingdom or elsewhere);

(ii) leaving any rights outstanding; and

(iii) having served to establish a priority date in relation to another application, wherever made.

(5) In this section "relevant application" means any of the following applications which has a date of filing, namely -

(a) an application for a patent under this Act;

(aa) an application in or for a country (other than the United Kingdom) which is a member of the World Trade Organisation for protection in respect of an invention which, in accordance with the law of that country or a treaty or international obligation to which it is a party, is equivalent to an application for a patent under this Act;

(b) an application in or for a convention country (specified under section 90 below) for protection in respect of an invention or an application which, in accordance with the law of a convention country or a treaty or international convention to which a convention country is a party, is equivalent to an application for a patent under this Act.

60 In essence, there are two questions I will need to answer with regard to the priority date of the patent: (i) *Is D8 a 'relevant application' for the purposes of section 5(3)?* And (ii) *can the skilled person derive the invention of claim 1 of the patent from D8?* If the answer to both questions is 'yes', then the patent is not entitled to the claimed priority date of 4<sup>th</sup> June 2012 based on section 5(3) of the Act, and the priority date of the patent is the filing date. If the answer to either question is 'no' – then Section 5(3) of the Act does not apply, and the claimed priority date of 4<sup>th</sup> June 2012 is valid.

*Is D8 a 'relevant application' for the purposes Section 5(3) of the act?*

61 The defendant has commented that it is not clear whether D8, which is a US provisional application, is a 'relevant application' for the purposes of section 5(3) of the Act. In particular, they note section 5.30 of the Manual of Patent Practice (MOPP)<sup>3</sup>, which discusses section 5(5), and emphasise that the status of a US provisional application as a suitable basis for a priority claim has not been tested in proceedings before the courts or comptroller. Section 5.30 of MOPP, as emphasised by the defendant, reads:

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<sup>3</sup> [Manual of Patent Practice](#)



“What constitutes “protection for an invention” is not specified in the Act; however s.5 is intended to have the same effect as the corresponding provisions of the EPC, and it appears likely that the term is restricted to the kinds of application referred to in Art.87(1) EPC, which allows priority to be claimed only from an application for a patent, for the registration of a utility model (e.g. German Gebrauchsmuster), for a utility certificate or for an inventor’s certificate. During pre-grant proceedings in the Office no objection should be raised to a claim to priority based on a US provisional patent application (notice in Official Journal (Patents), 31 January 1996). Such a provisional application is valid in the USA as a priority document for a subsequent patent application and expires after one year. Following a change in US law in 1999, a provisional application can be converted into a full US patent application within one year of filing. **UK practice as it relates to US provisional applications would have to be reviewed if doubt were to be cast upon it in any proceedings before the courts or the comptroller.**”

62 The claimant considers D8 to be a ‘relevant application’ for the purposes of section 5(3). The claimant submits that the primary purpose of a US provisional application is that it can serve as the basis for a later, full patent application, and question what reason there would be for filing a provisional application if it were not for that purpose. The claimant argues that the defendant has, by their own actions, acknowledged that D8 did serve as a ‘relevant’ application because it exercised its right to claim priority from D8 (the defendant also referred to two other EP patent applications which claim priority from US provisional applications). Mr Ferrar emphasised at the hearing that thousands, if not tens of thousands, of provisional US applications go on to serve as priority for PCT applications and to not consider them to be ‘relevant applications’ would be going against a huge swathe of examples to the contrary.

63 The claimant has also discussed that Art.87(1) EPC in conjunction with the Notice from the President of the EPO dated 26<sup>th</sup> January 1996 OJ EPO 1996<sup>4</sup> make clear that US provisional application falls within this definition, and thus forms a ‘relevant application’. Paragraph 3 of the Notice concludes:

“Since the (US) provisional application meets in substantive terms the requirements the EPC places on a duly filed national application in order to establish priority and because the subsequent fate of this filing is immaterial, the EPO, while acknowledging the independent decision-making competence of the EPO boards of appeal and the courts of the contracting states, recognises the **provisional application for patent as giving rise to a right of priority within the meaning of Article 87(1) EPC.**”

64 The EPO has recognised that US provisional applications give rise to a right of priority. Section 130(7) specifies that Section 5 of the Act is intended to have the same effect as Art.87(1) EPC. Consequently, I do not believe that there is a doubt that a US provisional application gives rise to a right of priority under section (5). In particular, as a US provisional application is made in a country which is a member of

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<sup>4</sup> [OJ 01-02/1996 p. 1-127 \(epo.org\)](#) see pages 81&82

the WTO and can be converted into a full patent application, it is equivalent to an application for a patent under the Act (as per section 5(5)(aa) of the Act). A US provisional application is thus a 'relevant application' under section 5(5) of the Act. Consequently, I find that D8 is a 'relevant application' for the purposes of section 5(3), and the answer to the first question (i) is: yes.

Can the skilled person derive the invention of claim 1 of the patent from D8?

- 65 It is well established practice, that for a claimed invention to be entitled to priority from an earlier application, it must be "supported by matter disclosed" in that earlier application (see section 5(2)(a)). Article 87(1) of the European Patent Convention expresses the requirement as being that priority can only be accorded in respect of "the same invention" as one in the earlier application.
- 66 In case G2/98<sup>5</sup> the Enlarged Board of Appeal of the EPO equated "the same invention" in Article 87(1) with "the same subject-matter" in Article 87(4). It expressed the requirement for claiming priority as follows:
- "The requirement for claiming priority of 'the same invention', referred to in Article 87(1) EPC, means that priority of a previous application in respect of a claim in a European patent application in accordance with Article 88 EPC is to be acknowledged only if the skilled person can derive the subject-matter of the claim directly and unambiguously, using common general knowledge, from the previous application as a whole."
- 67 The Court of Appeal explained this requirement in *Unilin Beheer NV v Berry Floor NV*<sup>6</sup> at paragraph 48 as follows:
- "The approach is not formulaic: priority is a question about technical disclosure, explicit or implicit. Is there enough in the priority document to give the skilled man essentially the same information as forms the subject-matter of the claim and enables him to work the invention in accordance with that claim?"
- 68 As Kitchin J. as he was then observed in *Abbott Laboratories Ltd v Evysio Medical Devices plc*<sup>7</sup> at paragraph 228, after citing G2/98 and *Unilin v Berry*
- "So the important thing is not the consistency clause or the claims of the priority document but whether the disclosure as a whole is enabling and effectively gives the skilled person what is in the claim whose priority is in question. I would add that it must "give" it directly and unambiguously. It is not sufficient that it may be an obvious development of what is disclosed."
- 69 Therefore, in order for the patent's claimed priority date to be invalid based on section 5(3) of the Act, the invention must be disclosed in D8 such that the skilled person can derive, directly and unambiguously using common general knowledge, the subject matter of claim 1 of the patent from D8 as a whole.

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<sup>5</sup> G2/98 [2001] OJEPO 413 , [2002] EPOR 167

<sup>6</sup> *Unilin Beheer NV v Berry Floor NV* [2004] EWCA Civ 1021, [2005] FSR 6

<sup>7</sup> *Abbott Laboratories Ltd v Evysio Medical Devices plc* [2008] EWHC 800 (Pat), [2008] RPC 23

- 70 At the hearing Mr Ferrar went through D8 to explain where the various features of claim 1 could be found. Ms O'Flynn accepted that D8 disclosed features 'A-F' and 'H-N'. However, she did not accept that feature 'G' was disclosed in D8.
- 71 The claimant argues that feature 'G' is explicitly disclosed in D8, which is said to provide several explicit references to providing an automated or robot loading system. In particular, page 34 (step 14) explains that the can is loaded from the bottom of the HIP vessel, and the diagram on page 26 of Appendix A refers to a "Pick and Place Machine" "Cart/tracks", and "train A", and figure A-10-2 of Appendix A refers to a "HIP loading station" and a "HIP loading handler". Furthermore, the diagram on the final page of Appendix A is alleged to show a bottom loading HIP device powered by automatic or semi-automatic actuators to drive the bottom loader into the HIP chamber (as understood by the skilled person e.g. from step 14 on page 34). The claimant considers such a device to be "off-the-shelf" and commercially available as shown in D14. A similar device is also said to be shown in D17. Therefore, D8 discloses the use of a robot of an automated loading system.
- 72 The claimant also argues that a robotic system of feature 'G' is implicitly disclosed in D8. In particular, "Section A-8.3 Maintenance" on page 27 of Appendix A and page 52 of PLN clearly indicate that maintenance of the system is performed remotely – and thus the HIP system must be capable of automated or semi-automated remote operation as users are not permitted to access the HIP chamber. Furthermore, a processing environment involving products at high temperatures and radioactive and/or dangerous materials (e.g. Mercury) will *necessarily* use some form of automated robotic equipment. The skilled person when reading D8, and armed with their common general knowledge, would necessarily infer that the apparatus in D8 comprises a robot/loading system for loading of the HIP vessel as the skilled person *would never seriously contemplate using a manual or non-robotic system*. The claimant also referred to D11-D16 to show remote processes/systems involved in HIP processes.
- 73 At the hearing, Mr Ferrar emphasised that feature 'G' was implicit and that no one would ever attempt to manually handle radioactive waste due to, not only the health and safety risks, but also the weight of the cans. Mr Ferrar felt that the question: "what does D8 show if not an automated system?" to be crucial to the assessment of the disclosure of D8. He also emphasised "Section A-8.3 Maintenance" on page 27 of Appendix A noting that the *maintenance* of the system had to be done remotely – let alone the *actual* operation.
- 74 The defendant has emphasised that the subject matter of claim 1 must emerge directly from D8, and considers that feature 'G' is not disclosed anywhere in D8 either explicitly or implicitly. The defendant notes that the claimant's explanation regarding feature 'G' in D8 is lengthy and refers to numerous prior art documents. The defendant argues that if there were a direct and unambiguous disclosure of the feature 'G' in D8, then it should be much easier to explain where and how D8 discloses this feature.
- 75 More specifically, whilst the defendant notes that the diagram on page 26 of Appendix A and Figure A-10-2 refer to various features such as a "pick and place machine" and "HIP loading handler", they consider that these features are not used to load and unload a sealed can through the bottom of the HIP vessel, but instead

perform other tasks. With regard to the diagram on the final page of Appendix A, the defendant does not consider any alleged “automatic or semi-automatic actuators to drive the bottom loader into the HIP chamber” to be equivalent to at least one robot of an automated loading system.

- 76 At the hearing Ms O’Flynn noted that the diagram on page 26 of Appendix A, figure A-10-2 of Appendix A did not reach the threshold of a direct disclosure of feature ‘G’. She considered that, looking at these respective figures, you could not identify both bottom loading and using at least one robot of an automated loading system. Similarly, with the diagram on the final page of Appendix A, Ms O’Flynn considered that the fact that there was difficulty in trying to understand what it showed demonstrated that there was not a clear and unambiguous disclosure of using an automated loading system. Ms O’Flynn noted that whilst the diagram on the final page of Appendix A may disclose hydraulics, this is not the same as using at least one robot of an automated loading system (e.g. not all hydraulic systems are necessarily automated loading systems).
- 77 Having considered D8 carefully, I conclude that the feature in claim 1 of “loading of the can through a bottom of the HIP vessel, wherein loading the can through the bottom of the HIP vessel includes using at least one robot of an automated loading system” (i.e. feature ‘G’), as it would be construed by the person skilled in the art, is at least implicitly disclosed in D8. The person skilled in the art would look at the diagram on the last page of appendix A and, based on their CGK and the context discussed in the various other sections of D8, understand this diagram to be showing (see device highlighted by the arrow in paragraph 40 above) a mechanism for raising/lowering a can into/out of the furnace, which does not require human contact – and thus discloses a robot of automated loading system. In particular, the person skilled in the art would understand the diagram to show hydraulic means for actuating the mechanism to load the can. I would note that it is *not* the case that the loading mechanism in this diagram being automated *is an obvious development* – rather the skilled person would look at the diagram and understand that this is a mechanism for loading a can into the HIP furnace and it would *necessarily* have no direct human involvement due to the practicalities of processing heavy radioactive waste. The fact that the diagram does not provide an explicit statement that there is an automated mechanism for loading the can does not prevent the skilled person from unambiguously deriving such information.
- 78 Thus, the answer to the second question: *(ii) Can the skilled person derive the invention of claim 1 of the patent from D8?* Is also ‘yes’. Therefore, the patent’s claim to a priority date of 4<sup>th</sup> June 2012 is invalid under section 5(3) of the Act. Consequently, the effective priority date of the patent is the filing date of 4<sup>th</sup> June 2013.

## **Novelty**

- 79 Section 1(1) of the Act reads:

A patent may be granted only for an invention in respect of the following conditions are satisfied, that is to say –

- (a) the invention is new;

(b) it involves an inventive step...

80 Section 2(2) of the Patents Act 1977 states:

The state of the art in the case of an invention shall be taken to comprise all matter (whether a product, a process, information about either, or anything else) which has at any time before the priority date of that invention been made available to the public (whether in the United Kingdom or elsewhere) by written or oral description, by use or in any other way.

81 The effective priority date of the patent is the filing date of 4<sup>th</sup> June 2013. Therefore, D8 and D9 are prior art documents under Section 2(2) as they were published on the 2<sup>nd</sup> May 2013. As accepted by Ms O'Flynn at the hearing, the method of claim 1 of the patent is very clearly disclosed in D9. Furthermore, as discussed above in paragraphs 70-77, the features of claim 1 of the patent are also disclosed in D8. Therefore claim 1 of the patent is not novel in light of D8 and D9.

82 With regard to dependent claims 2-14, Ms O'Flynn confirmed at the hearing that if claim 1 falls the other claims would fall. Consequently, claims 2-14 of the patent are also not felt to be novel in light of D8 and D9.

### **Inventive Step**

83 Since I have found all the claims as lacking novelty it is not strictly necessary to go on and consider the alternative objection that the patent lacked an inventive step having regard to D1. Since it was pleaded and argued however I will briefly address it. In assessing whether or not an invention would have been obvious it is easy to be misled by hindsight. Therefore, it has become the practice to approach the question in a step-by-step way, as first laid down in the Windsurfing case. More recently it has been restated by the Court of Appeal in *Pozzoli*<sup>8</sup> where Jacob LJ noted: -

I would restate the Windsurfing questions thus:

(1) (a) Identify the notional "person skilled in the art" (b) Identify the relevant common general knowledge of that person;

(2) Identify the inventive concept of the claim in question or if that cannot readily be done, construe it;

(3) Identify what, if any, differences exist between the matter cited as forming part of the "state of the art" and the inventive concept of the claim or the claim as construed;

(4) Viewed without any knowledge of the alleged invention as claimed, do those differences constitute steps which would have been obvious to the person skilled in the art or do they require any degree of invention?

84 I have considered the skilled person and their CGK above.

85 The inventive concept of claim 1 of the patent resides in a method of hot isostatic pressing (HIP) a sealed can containing a calcinated radioactive pre-HIP powder by loading the sealed can through a bottom of a HIP vessel, wherein loading the can through the bottom of the HIP vessel includes using at least one robot of an automated loading system. The HIP within the vessel is performed at a temperature

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<sup>8</sup> *Pozzoli SPA v BDMO SA* [2007] EWCA Civ 588

ranging from 1000 °C to 1250 °C and a pressure ranging from 30 to 100 MPa for a time ranging from 10-14 hours.

- 86 Document D1 is considered to be the state of the art for the purposes of assessing inventive step. At the hearing Mr Ferrar discussed what was disclosed in D1, with particular reference to pages 130-131. Ms O'Flynn agreed that D1 disclosed the features of claim 1 except for feature 'G'. Therefore, the difference between D1 and the inventive concept is "loading the sealed can through a bottom of a HIP vessel, wherein loading the can through the bottom of the HIP vessel includes using at least one robot of an automated loading system".
- 87 The claimant argues that D1 does not involve an inventive step, as using at least one robot of an automated loading system is CGK in the nuclear industry. In particular, documents D2-D7 and D11-D16 are felt to demonstrate that bottom loading of a HIP vessel and the use of automated system are commonplace in the industry, and further provide evidence that such systems are commercially available. D3 was emphasised as discussing automation which focussed on bottom loading (see e.g. "design parameters" on page H51). Therefore, the skilled person would consider modifying the apparatus in D1 using their CGK to arrive at the present invention, such that the differences between D1 and the inventive concept would be obvious to the person skilled in the art.
- 88 The defendant does not accept that the differences between D1 and claim 1 of the patent would have been obvious to the person skilled in the art. At the hearing Ms O'Flynn emphasised that the inventors had found that loading the sealed can through the bottom of the HIP vessel using at least one robot of an automated loading system provides much greater flexibility for the design of the can – such as easier loading, a decrease in process time and greater flexibility.
- 89 Ms O'Flynn noted that, starting from D1, the skilled person would have a number of choices to make when developing the process step for loading the sealed can into the vessel. In particular, they could choose a top-loading or a bottom-loading process step. This is not a trivial choice as this implicates a number of different variables, such as cannister design and process conditions based on that design. Furthermore, choosing the mechanism for loading the can into the HIP vessel is also not trivial because it will affect the complexity of the process, for example affecting safety and affecting cost. Therefore, the skilled person does have, starting from D1, and seeking to develop a process step for loading, a number of different choices that they would need to make.
- 90 Ms O'Flynn also emphasised that the present invention is not simply a HIP method – it's a HIP method for consolidating the calcined material comprising radioactive material. Ms O'Flynn noted the passage in D3 which states (in the "Remarks" section on page H51) that "HIP systems of this size and configuration are available from Auto Clover Engineers Inc and ASEA Inc. *Considerable developments efforts are required to adapt to remote and radioactive process*". Therefore, argues Ms O'Flynn, the fact that there is a bottom-loading system commercially available does not mean that it was part of the common general knowledge for the skilled person to apply such a bottom-loading HIP in processing radioactive material. Similar comments were made regarding figure 4 of D7 – which refers to "work being underway" to demonstrate the process non-radioactively at scale.

- 91 Ms O'Flynn argues that, whilst the claimant has established that bottom-loading systems were known at the priority date (e.g. D11) there is a gap between showing that such HIP systems existed and showing that they would have been the obvious choice to the skilled person starting from D1 and developing a loading process. The defendant considers that it would not have been obvious to choose a bottom-loading system in combination with automation features, based on their common general knowledge.
- 92 The disclosure of D1 with regard to systems or processes for handling the can is minimal at best. Therefore, starting with what is disclosed in D1, I fail to see how the person skilled in the art, equipped with their CGK, would arrive at the loading arrangement of invention of claim 1 without some degree of invention. Nothing in D1 points them towards any particular loading arrangement. Furthermore, whilst the loading of the can into the HIP is prima facie a choice of two, i.e. bottom or top loading, both of which the skilled person would likely be aware of, the choice of bottom loading a can along with the machine/mechanism to do so, is not an arbitrary one (cost; safety; type of can being processed etc.). Whilst it can be easy to look at D1 with hindsight and arrive at a bottom loading system including a robot of an automated loading system, I conclude such an arrangement would be an inventive leap to the person skilled in the art presented with D1 and equipped with their CGK.
- 93 Consequently, claim 1 of the patent is inventive in light of D1.

### **Sufficiency**

- 94 The claimant has also argued that the patent specification as a whole does not describe the robot of the automated loading system in sufficient detail for a person skilled in the art to reproduce the invention.
- 95 At the hearing Mr Ferrar noted that the reason why automation is not disclosed in detail in the patent is because the plan was to use what is commercially already available. Furthermore, there is no disclosure in the patent of the practical considerations of an automated system such as lifting heavy radioactive material, sequencing of events, the type of controls, the type of overrides you might need. All of these practical considerations are lacking. Mr Ferrar also considers that if the robot system is deemed to be an invention, then why is it not disclosed in any technical detail whatsoever in the specification? So just to say that it is automated and to claim that that is an invention whilst providing absolutely no disclosure of how it is automated means that those two arguments are contrary to each other.
- 96 The defendant disagrees that the patent is insufficient. They note that, whilst the method of claim 1 is inventive, this does not mean that the skilled person would have been unable to carry out the loading step of claim 1. Using the teaching of the patent and their CGK the skilled person would have been able to carry out the loading step. Ms O'Flynn considers that the present inventors have integrated different process steps and features in a non-obvious way to provide a novel process that, once described, as it has been in the present patent, can be carried out by the skilled person.
- 97 The type of sufficiency under consideration here is so called "classical sufficiency" and relates to the situation where there is no enabling disclosure. Classical

insufficiency arises where the express teaching of the patent does not enable skilled addressee to perform the invention<sup>9</sup>.

98 Whilst the claimed invention is defined in broad terms as using “a robot of the automated loading system”, I am satisfied that the skilled person equipped with their CGK would be able to perform the invention. As argued by the claimant the automated loading system itself is allegedly commercially available, and thus the method of claim 1 is sufficiently disclosed to the skilled addressee. Nor do I consider there to be any contradictions or inconsistencies in the fact that loading the can through the bottom of the HIP vessel using a robot of an automated loading system provides an inventive step. Automated systems are felt to be within the CGK of the person skilled in the art and thus such a person would be able to work the invention. However, *the choice* of a particular loading arrangement and the corresponding automated system (which may be “off-the-shelf”) is where the inventive step resides.

### **Conclusions and order**

99 I have found that priority date of 4<sup>th</sup> June 2012 of the patent is invalid under section 5(3), and thus the effective priority date is its date of filing. I have found that claims 1-14 are invalid as they lack novelty in light of D8 and D9.

100 I have found that claim 1 provides an inventive step in light of D1.

101 I dismiss the argument that claim 1 is insufficient.

102 The defendant did not offer up any arguments in respect of the dependent claims or any possible saving amendments with Ms O’Flynn accepting that the patent stood or fell with claim 1. Consequently, I find patent EP2856472B3 to be invalid and I order that it be revoked.

### **Costs**

103 It is long established practice that in proceedings before the comptroller only a contribution towards the successful party’s costs should normally be awarded and that the amount should be guided by the comptroller’s published scale<sup>10</sup> unless the circumstances warrant departing from the published scale. In this case both sides were content with an award in line with the published scale. The claimant has been successful in its application and is therefore entitled to an award in its favour. Hence, I award the claimant the sum of £1700 as a contribution to its costs. This is made up of the following:

£400 for preparing a statement and considering the other side's statement

£500 for preparing evidence and considering and commenting on the other side's evidence:

£800 for preparing for and attending the hearing.

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<sup>9</sup> *Zipher Ltd v Markem Systems Ltd* [2009] FSR 1

<sup>10</sup> [TPN 2/2016 Costs in proceedings before the Comptroller](#)



104 This should be paid by the defendant to the claimant within 12 weeks of this decision.

**Appeal**

105 Any appeal must be lodged within 28 days after the date of this decision.

**PHIL THORPE**

Deputy Director acting for the Comptroller