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← Industry Research → & Development Board v Coal & Allied Operations Pty Ltd [2000] FCA 979 (24 July 2000)

Last Updated: 24 July 2000

FEDERAL COURT OF AUSTRALIA

← Industry Research → & Development Board v Coal & Allied Operations Pty Ltd [\[2000\] FCA 979](#)

INCOME TAX - tax concession for expenditure on industrial research and development activity - ← **Industry Research** → and Development Board refusing to give a certificate under s 39L of the ← [Industry Research and Development Act 1986](#) → (Cth) that certain activities qualified as "research and development activities" as defined in subs 73B(1) of the [Income Tax Assessment Act 1936](#) (Cth) - decision by Administrative Appeals Tribunal that the activities in dispute did satisfy the definition - appeal by the Board to Court under [s 44](#) of the [Administrative Appeals Tribunal Act 1975](#) (Cth) - meaning of expressions "involved", "innovation" and "technical risk" in the definition.

WORDS AND PHRASES - "involved" - "innovation" - "technical risk".

[Income Tax Assessment Act 1936](#) (Cth) s 73B(1) (Research and Development Activity)

← [Industry Research and Development Act 1986](#) → (Cth) s 39L

← **Industry Research** → and Development Board v Unisys Information Services Australia Ltd [\(1997\) 77 FCR 552](#), applied

Minister for Immigration and Multicultural Affairs v Singh [\[2000\] FCA 845](#), cited

← INDUSTRY RESEARCH → & DEVELOPMENT BOARD v COAL & ALLIED OPERATIONS PTY LIMITED

N 722 of 1999

LINDGREN J

24 JULY 2000

SYDNEY

IN THE FEDERAL COURT OF AUSTRALIA

NEW SOUTH WALES DISTRICT REGISTRY N 722 OF 1999

ON APPEAL FROM THE ADMINISTRATIVE APPEALS TRIBUNAL, CONSTITUTED BY A
DEPUTY PRESIDENT

BETWEEN:  **INDUSTRY RESEARCH**  AND DEVELOPMENT BOARD

APPLICANT

AND: COAL AND ALLIED OPERATIONS PTY LIMITED

RESPONDENT

JUDGE: LINDGREN J

DATE OF ORDER: 24 JULY 2000

WHERE MADE: SYDNEY

THE COURT ORDERS THAT:

1. The application be dismissed.
2. The applicant pay the respondent's costs.

Note: Settlement and entry of orders is dealt with in Order 36 of the Federal Court Rules.

IN THE FEDERAL COURT OF AUSTRALIA

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BETWEEN:  **INDUSTRY RESEARCH**  AND DEVELOPMENT BOARD

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RESPONDENT

JUDGE: LINDGREN J

DATE: 24 JULY 2000

PLACE: SYDNEY

REASONS FOR JUDGMENT

Introduction

1 The applicant ("the IRDB") appeals pursuant to [s 44](#) of the *Administrative Appeals Tribunal Act 1975* (Cth) ("the [AAT Act](#)") from a decision of the Administrative Appeals Tribunal ("AAT") on an

application successfully made to the AAT by the present respondent ("C&A") under s 39T of the [Industry Research & Development Act 1986](#) (Cth) ("IR&D Act"). C&A's application to the AAT had been for review of a decision of the IRDB through its delegate, the Tax Commission Committee ("TCC"), which the IRDB had, again through the TCC, reconsidered and confirmed.

2 The object of the IR&D Act is (s 3):

"...to promote the development, and improve the efficiency and international competitiveness, of Australian industry by encouraging research and development activities."

The "encouragement" takes the form of the granting of income tax concessions in respect of expenditure on research and development activities. C&A claimed that it carried on such activities.

3 Section 39L of the IR&D Act provides that the IRDB may give to the Commissioner of Taxation ("the Commissioner"):

"a certificate stating whether particular activities that have been or are being carried on by or on behalf of a person were or are research and development activities".

The IRDB declined to give a certificate in respect of some of C&A's activities which C&A claimed were "research and development activities".

4 Pursuant to subs 39S(2) of the IR&D Act, C&A requested the IRDB to reconsider its decision. The IRDB did so but, under s 39S(4), confirmed its primary decision. C&A then applied under s 39T of the Act to the AAT for review of the decision of the IRDB that had been confirmed. On 28 June 1999 the AAT set aside the decision under review and remitted the matter to the IRDB with a direction that it issue a certificate under s 39L of the IR&D Act favourable to C&A in respect of the activities in dispute.

5 On 26 July 1999 the IRDB commenced this proceeding under [s 44](#) of the [AAT Act](#). The right of appeal from a decision of the AAT under that section is on questions of law.

Relevant legislative provisions

6 The issue before the AAT was whether it should certify under s 39L of the IR&D Act that "particular activities" had been carried on by C&A, and, if so, whether they were "research and developmental activities" within the meaning of that section. Section 39L occurs in Part IIIA of the IR&D Act. Section 39A, the first section in that Part, provides in subs (2), relevantly, that expressions used in Part IIIA that are defined by s 73B of the [Income Tax Assessment Act 1936](#) (Cth) ("ITAA 36") have, in [Part IIIA](#), unless the contrary intention appears, the same meanings as they have in that section.

7 A definition of "research and developmental activities" in subs 73B(1) of the ITAA 36 was introduced by the [Income Tax Amendment \(Research and Development\) Act 1986](#) (Cth), and was replaced by a new definition by the [Taxation Laws Amendment Act \(No 4\) 1994](#) (Cth) (No 181 of 1994) [s 3](#) and Sch 4, [Part 2](#). (That definition was further amended in 1996 by the [Taxation Laws Amendment Act \(No 3\) 1996](#) (Cth).) The definition as originally enacted and the definition as substituted by the 1994 Act were applicable here because C&A's claims related to expenditures spread over two years of income, one covered by each definition. Happily, apart from a difference in the structure of the two definitions, the only difference between them is that the earlier one does, and the later one does not, require that the activities be carried on in Australia or in an external Territory. Since all of the activities in question were carried on in Australia, this difference is inconsequential.

8 As substituted in 1994, the definition was as follows:

"(1) In this section, unless the contrary intention appears:

'research and development activities' means:

(a) systematic, investigative or experimental activities that **involve** innovation or technical risk and are carried on for the purpose of:

(i) acquiring new knowledge (whether or not that knowledge will have a specific practical application); or

(ii) creating new or improved materials, products, devices, processes or services;

or

(b) other activities that are carried on for a purpose directly related to the carrying on of activities of the kind referred to in paragraph (a)"(my emphasis)

9 The AAT referred to the activities described in par (a) as "core" activities and those described in par (b) as "supporting" activities. Paragraph (a) has been referred to as the "first limb" and par (b) as the "second limb" of the definition. The definition can be analysed as follows:

(a) First limb - core activities

Activities that:

1. are systematic **or** investigative **or** experimental;

and

2. involve innovation **or** technical risk;

and

3. are carried on for the purpose of

(i) acquiring new knowledge

or

(ii) creating materials **or** products **or** devices **or** processes **or** services

that are, in each case, new **or** improved.

(b) Second limb - supporting activities

Other activities that are carried on for a purpose directly related to the carrying on of a core activity.

Background facts

10 The facts relate to C&A's "Alluvial Lands Project" which was located within its Hunter Valley Mine, approximately thirty kilometres north-west of Singleton. The objective was to enable alluvial lands to be

mined, and, to that end, to prevent, by the construction of a four kilometre long cut-off wall and levee bank, the intrusion of water into the lands to be mined. The coal mining on alluvial lands had not been tried previously in Australia.

11 Subsection 39T(4) of the IR&D Act provides that a hearing of a proceeding before the AAT relating to a reviewable decision must take place in private. The AAT's Reasons were therefore expressed in such a way as to keep confidential the identity of C&A. Notwithstanding this, I find it convenient to relate the background facts by simply setting out the relevant paragraphs of the AAT's Reasons for Decision:

"2. It [C&A] carries out coal mining operations in the Hunter Valley. Its mining area included alluvial lands which contained many millions of tonnes of coal reserves. This alluvial area consisted of land below the one in one hundred year flood level and was composed of unconsolidated alluvial materials which were extremely permeable. These alluviums had direct contact with the Hunter River. Unless preventative measures were taken, it would have been impossible to mine the alluvial area because of the large inflows of water into the mining operation which might otherwise be expected.

3. The evidence was that coal mining on alluvial lands had been previously unknown in Australia. They had not been mined not only because of the technical difficulties associated with mining these areas, but also because of the possible environmental consequences that might follow unsuitable mining activities. Although there had been some mining of alluvial valley floors in the United States of America, the evidence was that none of those mines had been subject to a large hydraulic head from flooding which was a feature of the present site.

4. In order to mine the alluvial lands and exploit the available coal reserves, the applicant decided to construct a cut-off wall and levee bank to prevent an ingress of sub-surface waters and surface flood waters into the mining area. Extensive investigations were carried out leading to the design of the cut-off wall which was eventually accepted. These investigations focussed on the physical characteristics of the alluviums, the geotechnical conditions within the alluviums along the length of the cut-off wall, the maximum forces encountered in flooding and other sources of wall instability.

5. Soil-bentonite technology was chosen as a means of preventing ground water flowing into the mining area. Put simply, soil-bentonite technology involves the design and construction of a wall composed of bentonite and suitable soil and placing that wall in such a position as to block off the flow of unwanted waters. The evidence was that this technology had not previously been used in the coal mining industry, nor had it been used in the geological conditions that existed in the alluvial area, namely in the presence of dense soils, solid rock and coal. In particular, it had not been used in situations where there was a potential for large hydraulic heads from flooding as was the case in this proposed mine.

6. Detailed investigations were undertaken into the siting and height of a levee. The design proposed that the cut-off wall be keyed into and be an integral part of the levee. Considerable emphasis was placed on designing the levee and cut-off wall interface after laboratory studies into the settlement behaviour of a range of soil-bentonite backfill mixes had been conducted. The combined levee and cut-off wall

structure were intended to act as a barrier to floods and ground water flows.

7. The applicant then undertook a program of monitoring the integrity of the wall and levee. The program is still ongoing and will continue during the life of the mine, estimated at 10 years. The monitoring and testing followed the de-watering of the alluvial aquifer, that is to say the removal of water from the proposed work site. The evidence was that the development of a cut-off wall and levee bank to allow alluvial lands to be mined had not been done on a significant scale, either in Australia or in any other part of the world.

8. A soil-bentonite cut-off wall involves the excavation of a relatively narrow trench which is continually topped up with a bentonite slurry. Bentonite is a form of clay. This slurry has properties including high swell, high water absorption and low permeability which prevent the trench from collapsing. Bentonite forms a weak structure when placed in solution, has self-healing properties when broken and has the ability to form a filter cake.

9. De-watering involved the sinking of bores on the river side of the mine. These were spaced on a grid pattern with intervals depending on local permeability. As with catch drains, the evidence was that there were difficulties with constructing a bore field that could cope with high river level conditions. There were also significant costs involved both in the construction and maintenance of the bore field, as well as high energy costs required to run the bore field pumps.

10. The applicant's principal area of expenditure, for present purposes, was laid out in the construction of the cut-off wall and levee bank. The slurry cut-off wall trench was excavated using bentonite slurry trenching methods and was then back-filled with a mixture of soil and bentonite to provide an impervious wall. Its maximum depth below the natural surface was approximately 30 metres.

11. Difficulties were encountered in the excavation because of the presence of a coal seam over a 1,150 metre length. This excavation was expected to be difficult because of the variety of hardness bands running through the seam. As it turned out, the contractor did experience considerable problems in this part of the work.

12. Eventually the construction was completed through the use of a combination of four hitherto uncombined, but nevertheless common engineering techniques. The machines and methods used were hydro-fraises, long stick excavators with specially modified buckets which allow ripping of hard material at depth, large diameter drilling through the slurry and the use of blasting under the bentonite slurry.

13. In late 1994, the applicant applied to the respondent for an advance ruling on the whole project involving the mining of alluvial lands. At its meeting on 1 March 1995, the tax concession committee ('TCC') (a delegate of the respondent Board) gave an unfavourable opinion on the whole of the project on the grounds that the claimed activities did not comply with the definition of research and development activities as set out in section 73B of the [Income Tax Assessment Act 1936](#).

14.

15.

16.

17. *A second application was lodged on behalf of the applicant for the 1994 calendar year. This project was considered to be the same project as outlined in the advance ruling which had been rejected in March 1995.*

18. *A third application for registration for the 1995 calendar year was received by the respondent Board on 1 July 1996. This application related to the same project, but by this time the respondent Board was prepared to take a different view. The claimed activities considered by the TCC were:*

(1) Investigation and design of a suitable ground and flood water protection system that comprised:

(a) Overseas investigation of alluvial valley floor mining in USA.

(b) Assessment of various options that led to the choice of pursuing a Cut-off Wall type to control ground water and minimise seepage.

(c) Research and design of a soil-bentonite cut-off wall.

(d) Investigations leading to a choice of levee bank design.

(e) Research and design of the levee bank and the interface join between the cut-off wall and levee bank.

(2) Construction of the cut-off wall and levee bank which includes instrumentation to measure performance of the wall and bank.

(3) Dewatering the alluvial mine site area to allow mining to commence.

(4) Blasting and mining a technically determined section (about 1000 metres) of the alluvial area adjacent to the cut-off wall and levee bank.

19. At its meeting on 2 October 1996, the TCC decided that some activities (referred to as core activities) were covered by paragraph (a) of section 73B(1) and some (described as supporting activities) were covered by paragraph (b). Activities described above in paragraphs (1)(a), (b), (c), (d) and (e) involving the investigation and design of a water protection system were accepted as complying with the definition. The activities described above in paragraphs (2), (3) and (4), namely the construction, de-watering and blasting stages of the project, were rejected. Activities 1(c), (d) and (e) were accepted as eligible core activities as they were systematic, investigative or experimental activities which involved innovation or technical risk and were carried on for the purpose of acquiring new knowledge or creating new or improved materials, products, devices, processes or services. The TCC determined that activities (1)(a) and (b) were not core activities but accepted that they did directly relate to the core activities and were therefore supporting activities.

20. The activities mentioned in paragraphs (2), (3) and (4) are those that are the subject of the present proceedings. They were rejected by the TCC as the respondent's delegate for

the reason that the primary technical problems associated with the cut-off wall would be solved by the design, development and testing activities [1(c), (d) and (e)], that these activities would lead to the specifications for the construction of the wall and that construction would not involve any systematic, investigative or experimental activities but rather the application of known bentonite techniques. The TCC further determined that the construction of the wall and levee, de-watering of the aquifer and blasting would not be carried on for the dominant purpose of acquiring new knowledge or creating new or improved materials, products, devices, processes or services. Rather, it said, they were carried on for purposes associated with mining and so could not be considered to be core activities as they would not involve acquiring new knowledge of creating new or improved materials, products, devices, processes or services. The TCC also determined that they were not supporting activities."

12 The following diagrammatic representation of the soil bentonite cut-off wall and levee bank is taken from the papers:

[Click here for Picture](#)

13 The IRDB was asked to reconsider its decision in relation to the three outstanding activities: Activity No (2) (Construction), No (3) (Dewatering) and No (4) (Blasting and Mining). On 11 August 1997, the TCC, as delegate of the IRDB, decided under subs 39S(4) of the IR&D Act to confirm its decision of 2 October 1996 on the basis that none of the Construction, Dewatering and Blasting and Mining activities satisfied the terms of either limb of the definition of "research and development activities". However, the TCC revoked its decision of 2 October 1996 in one respect, namely, that a certain liquefaction study, described as "blasting and mining a technically determined section (about 1,000 metres) of the alluvial area adjacent to the cut-off wall and levy bank", did constitute an activity falling within the second limb, that is, did constitute a supporting activity. The liquefaction study was also described as consisting of "approximately six blast shots ... to establish acceleration effects on soil-bentonite liquefaction which could cause cracking in the wall".

14 The result, prior to the hearing before the AAT, can be stated as follows:

Paragraph (a) (first limb) - core activities [as found]

Investigation and Design activities (1)(c), (d) and (e).

Paragraph (b) (second limb) - supporting activities [as found]

Investigation and Design activities (1)(a) and (b) and the liquefaction study.

Not within either limb [as found]

The remaining Construction (2), Dewatering (3) and Blasting and Mining (4) activities.

Reasoning of the AAT

15 The AAT concluded that the Construction (of the cut-off wall and levee bank) activity (Activity No 2 above) was a core activity for the purposes of the definition in subs 73B(1) of the ITAA 36, and that the Dewatering activity (Activity No 3 above) and the Blasting and Mining activity (Activity No 4 above) were supporting activities within the definition.

16 In coming to these views, the AAT firstly surveyed dictionary definitions of the terms used in subs 73B(1) and derived from them and from various earlier decisions of the AAT (*Re Charles IFE Pty Ltd and Industry Research and Development Board* 95 ATC 2149, *Re Philip Morris Ltd and Industry Research and Development Board* 98 ATC 2001, *Re Mobil Oil Australia Ltd and Industry Research and Development Board* 95 ATC 2042) and the decision of the Full Court of this Court in *Industry Research and Development Board v Unisys Information Services Australia Ltd* ([1997](#)) [77 FCR 552](#) ("*Unisys*"), the following general principles (at [26]):

"(a) The words are to be given their ordinary meanings and dictionary definitions are relevant (Unisys).

(b) Provided the condition of innovation or technical risk is not de minimis, the conditions are satisfied by the presence of innovation or technical risk of whatever degree and not necessarily of any particular degree (Unisys).

(c) There is no requirement that the innovation or technical risk must be substantial (Unisys).

(d) The Macquarie Dictionary definition of innovation is 'something new or different introduced' and 'the act of innovating, introducing of new things or methods'. Accordingly, an activity may be innovative because it is the first example of the large scale use of certain processes.

(e) The meaning of 'risk' is 'uncertainty as to outcome' and the word 'technical' qualifies 'risk' adjectivally and means 'belonging or pertaining to an art, science or the like'. An activity may, therefore, be innovative because the implementation had to pioneer new territory and may involve technical risk because, while there was little risk in the technology itself, there was induced risk in the attempt to apply it (Mobil Oil Australia).

(f) Technical risks may be involved because there is uncertainty as to practical outcome and whether the end product could be processed and sold commercially. It can also arise where there is a significant number of variables and it is difficult to ascertain the effect of the interaction of those variables (Unisys).

(g) So far as supporting activities are involved, these include activities which were in some way inputs to or of assistance to accepted core activities (Charles IFE). That decision is also authority for the proposition that a project may be eligible even though it is a mixture of activities some of which do and some of which do not meet the legislative requirements. That approach appropriately recognises that the legislation expressly focuses on the concept of research and development activities.

(h) In considering a claim for the development of a particular technology it is necessary to have regard to the whole project which involved activities prior to and subsequent to the relevant year (Philip Morris). Accordingly, it follows that segmenting the overall project or activities in question is contrary to the general proposition that eligibility applies to activities as a whole or, in commercial terms, to a project.

(i) The statement that it is the process not the product that must meet the criteria is not correct. There is nothing in the legislation requiring that the definition be read down to refer only to processes rather than products (Unisys at first instance [97 ATC 4848] not dissented from by the Full Court)."

17 The AAT then set out the IRDB's grounds of opposition to C&A's claims that the Construction, Dewatering and Blasting and Mining activities were within the definition.

18 The AAT next referred to five witnesses called by C&A and the one witness called by the IRDB, and for various reasons that it gave, said that it preferred the former. The six witnesses were as follows:

C&A:

John Archibald Capsanis, C&A's Senior Project Engineer on the project.

Nicholas J Cavalli, Area Manager of Hayward Baker Inc, New York, USA, a geotechnical construction firm specialising in ground modification.

Professor George Filz, Associate Professor of Civil Engineering, Virginia Polytechnic and State University, Virginia, USA.

Dr Edward Glen Truscott who had been at the time Senior Manager (Geotechnical and Dams) with Gutteridge Haskins & Davey Pty Ltd, Brisbane, and who was the principal designer and the director of the project throughout.

Richard Robert Davidson of Sydney, Senior Principal and Vice President of Woodward-Clyde, an international engineering consultant firm.

The IRDB:

Charles Frederick Fitzhardinge of Sydney, a very experienced consultant geotechnical engineer.

19 The AAT did not, at this point in its Reasons, summarise the evidence of these witnesses, with the exception of that of Mr Capsanis as to the purpose of the activities. Rather, the AAT's concern at this point was to identify the six witnesses, their qualifications and experience and to state its reasons for preferring the testimony of the five called by C&A.

"Project" or "activity"

20 The IRDB complains that the AAT erred by applying the statutory criteria to the project as a whole rather than to particular activities. For this reason I will emphasise references to the "project" in some of the passages from the AAT's Reasons set out below.

21 The first of the criteria outlined in par 73B(1)(a) is that core activities must be, "systematic, investigative or experimental". The AAT's first sentence after reviewing the expert evidence mentioned was (at [39]):

*"The first question to ask is whether the applicant's **project** involved systematic and [sic] investigative activities" (my emphasis).*

Since the AAT ultimately held that of the three activities under consideration, only Construction fell within par (a) of the definition, this criterion needs to be considered on the appeal only as it applies to Construction. In fact, however, the AAT had no hesitation in finding that all three activities (Construction, Dewatering, and Blasting and Mining) were carried out in accordance with a plan or organised method, ie that they were systematic as distinct from "haphazard". The AAT noted that the "pre-arranged plan" envisaged six stages prior to Dewatering and Blasting and Mining, that is, six stages of Construction,

namely (1) the construction of a platform, (2) the trenching, (3) the mixing and placing, (4) the connection with the levee, (5) testing and (6) instrumentation. The AAT then stated:

*"Not only was this **project** systematic; it involved investigative activities" (my emphasis)*

and explained:

"As will be seen later in these reasons, there were unknown areas at the commencement of the activities which had to be explored and investigated in a systematic manner."

"Innovation"

22 The AAT next asked itself "whether the **project** involved innovation" (my emphasis). Again in view of the AAT's ultimate conclusion that Construction alone fell within par (a) of the definition, for the purposes of the appeal this criterion also had to be met by the Construction alone. The AAT noted the IRDB's submission that any innovative activities had concluded prior to the commencement of the Construction phase, that is, that they had all been completed during the Design phase. It found, however, contrary to that submission, that the innovative activities continued after Construction began, that is, that designing was not concluded when construction began. It pointed to the fact that this was the first soil-bentonite cut-off wall through coal in the world and that the wall was the first ever with a connecting overlapping levee bank. The project also involved the world's first soil-bentonite slurry wall cut off for coal mine dewatering control and Australia's first soil-bentonite slurry wall excavated with a long reach excavator. The AAT accepted expert evidence that the instrumentation used was far in excess of that normally to be expected of mere "quality control".

23 Further, while the AAT seemed to accept that the machinery used was common in civil engineering works, it found that innovation resided in using the particular combination of engines to effect C&A's purpose, and noted that several kinds of instrumentation not ordinarily applied to soil-bentonite cut-off walls were used. In particular, in a passage attacked by the IRDB on appeal, the AAT stated:

*"It is not a correct way to approach a claim by **analysing individual segments and individual tools** used in **separate sections** of the project. Innovation should not be given a narrow meaning. It should be given a broad construction in order to promote the objects of the Act". (my emphasis)*

Again, on the issue of innovation, the AAT stated:

*"The principal reason why **the project** may be regarded as innovative is because there was **no precedent** for the construction of such a wall through coal and [C&A] was intent upon ascertaining whether the activities would succeed and provide a general model for further similar activities to be carried out in respect of other alluvial coal mines owned by the applicant." (my emphasis)*

24 The AAT said that the "whole thing" was shown to be innovative by the fact that it was the subject of "various papers of a learned kind at important conferences".

25 The AAT noted the testimony of Mr Fitzhardinge, the expert called by the IRDB,

*" ... that **the project** was an appropriate application of relatively uncommon but well-*

established construction techniques in conditions well within the range of previous experience in relation to slurry trench excavation, soil-bentonite cut-off wall technology and water barrier performance." (my emphasis)

The AAT also noted Mr Fitzhardinge's view that technical risk was absent as the uncertainties were "ordinary for such a project" and were appropriately managed in the design and construction using standard engineering approaches.

26 The AAT thought, however, that "the weight of the evidence" was contrary to Mr Fitzhardinge's opinion. It stated (at [47]) in a passage attacked by the IRDB on the appeal:

*"The construction aspect contributed a number of `indisputable firsts' as Mr Davidson put it. This was the first soil-bentonite slurry wall excavated with a long reach excavator in Australia. It was the first soil-bentonite slurry wall cut off for coal mine de-watering control in the world. It was the first soil-bentonite slurry wall through coal in the world. **To be first is, as I have indicated above, to be innovative.**" (my emphasis)*

27 In support of its finding that the Construction phase had involved "a good deal of instrumentation" which went beyond mere "quality control", the AAT referred to several kinds of instrumentation that were used for this project but that were not ordinarily applied to soil-bentonite cut-off walls. The AAT also noted expert testimony as to the ongoing significance for industry of the use made of the instrumentation in the project.

"Technical risk"

28 Again, in the light of the AAT's conclusion that of the three activities under consideration, Construction alone was a core activity, the "technical risk" criterion is of relevance on the appeal only to Construction.

29 The AAT accepted the evidence of Mr Davidson, the independent auditor of the original design, identifying eight technical risks. The AAT described them, apparently basing its summary descriptions of them on the more detailed accounts contained in an affidavit sworn by Mr Davidson on 26 June 1998.

30 The first technical risk was that of excessive settlement of the soil-bentonite wall and backfill. This risk was addressed during the process of construction. The AAT said that the settlement monitoring program was much more comprehensive than any ever done before, and, according to Mr Davidson, provided effective guidance for the ongoing adjustment of the design during the Construction phase. As well, according to Mr Davidson, the wealth of settlement data generated had provided invaluable data for other ongoing research programs and had assisted in resolving the settlement problem for certain other projects identified by him.

31 The second technical risk identified by Mr Davidson lay in the possibility of undisclosed defects within the wall. Such defects had been observed when contaminated slurry became entrapped within the backfill. To overcome this, the project adopted the novel device of a down-hole, bore hole camera for use in a slurry trench to inspect visually the quality of the backfill and the contact with the foundation. The AAT observed: "This new technique has now been added to the armoury of civil engineers".

32 The third technical risk was that the backfill would be too coarse or gap graded, producing an unacceptably high permeability. This risk was overcome by ensuring that the soil-bentonite backfill was designed to attain the grading required to provide a very low permeability seepage barrier. To this end fines were imported for some segments of the alignment and then added to the mix to obtain the needed

gradation. The AAT noted Mr Davidson's opinion that this provided an innovative technical precedent for other projects with problematic trench spoil gradations.

33 A fourth technical risk involved the matching of the backfilled gradation to filter compatible with the surrounding soil mass. Of this risk the AAT stated (at [52]):

"Normally, the soil-bentonite gradation is compatible because it has been borrowed from the same soils but where there is variation with depth there can be filter incompatibility. Formation of a filter cake reduces this potential but the controlled backfill grading provides a second line of defence. Mr Davidson gave evidence that he has since adopted the approach used for the construction of the subject wall on a number of subsequent projects."

(The material set out above is taken almost verbatim from par 14 of Mr Davidson's affidavit referred to earlier.)

34 The fifth technical risk involved the uncertainty surrounding the "excavatability of the sedimentary cap rock above the coal". In the event, this problem did not arise, although the AAT observed, "[t]he fact that a risk is happily resolved does not, of course, remove the uncertainty involved in an identified technical risk at the commencement of the project".

35 The sixth technical risk involved the excavation of coal, which turned out to be too hard to be excavated with the machinery intended for the purpose. The wall was, so far as Mr Davidson knew, the first ever to be constructed through coal. The solution was found in a combination of excavation equipment. The AAT recorded Mr Davidson's testimony that the coal excavation problems were unprecedented and that C&A's experience provided valuable information for later projects. Mr Davidson gave the Yallown Energy Project in Victoria as an example.

36 The seventh technical risk lay in the possible slurry loss into the surrounding alluvium which could cause trench collapses and high consumption of bentonite. The AAT found that this risk could be assessed only during construction by observation, although, again, it transpired that this risk did not eventuate.

37 The eighth and final technical risk was identified in the possibility of trench instability able to be caused by such factors as slurry loss, bentonite contamination, excessive excavation time, ground water migration and bentonite dilution. The AAT noted that while this risk also did not materialise, that it would not do so was not foreseeable and that there was no alternative to "taking the technical risk and working through it".

"Purpose"

38 In examining whether, relevantly for the appeal, Construction was carried on for either one of the two purposes specified in par 73B(1)(a), the AAT stated (at [28]):

"The normal rule of construction probably applies to subs. (1). In the context of that subsection, 'purpose' probably means 'the dominant purpose'."

In relation to C&A's purpose, the presiding Member made the following remarks (at [29]):

"[C&A's] purpose ... in carrying out the relevant activities was to acquire new knowledge by way of ascertaining whether the construction of a soil-bentonite cut-off wall with a connected overlapping levee bank in the context of a maximum hydraulic

gradient exceeding 30 was a cost-effective way of isolating underground and ground waters to enable open-cut mining of alluvial coal to take place. The company also had the purpose of creating a new or improved process or method for isolating underground and ground water to enable open open-cut mining of alluvial coal to take place, bearing in mind that a soil-bentonite cut-off wall had not previously been constructed for that purpose or in those conditions."

The AAT concluded, for all the above reasons, that the construction of the cut-off wall and the levee bank (Activity No (2)) was a core research and development activity.

Supporting activities

39 As noted earlier, the AAT concluded that the Dewatering activity (Activity No (3)) and the Blasting and Mining activity (Activity No (4)) were supporting activities, that is, activities carried on for a purpose directly related to the Construction activity. The presiding Member thought that the terminology "carried on for a purpose" embraced a subsidiary or subordinate purpose. In the present case, he found that C&A had a purpose in carrying out the Dewatering and Blasting which was "directly related to the carrying on of the construction activities".

40 In relation to the Dewatering activity (Activity (No 3)), which the AAT described in some detail, the AAT found the dominant purpose of this activity to be that of facilitating coal extraction, but a subsidiary purpose to be that of determining whether the soil-bentonite cut-off wall technology could be used to reduce seepage, and to facilitate coal extraction elsewhere, and of assisting directly in the supplementary design work encompassed within the Construction activity.

41 In relation to the Blasting and Mining activity (Activity No (4)), which the AAT also described in some detail, the AAT found that a purpose of this activity was to develop an understanding of the effect of future mining on the soil-bentonite. Therefore, according to the AAT, this was a supporting activity carried on for a purpose directly related to the carrying on of the core activity of construction of the wall and levee bank.

My reasoning on the present appeal

Amended grounds of appeal (i) (d), (e) and (iii) - "Project" or "activity"

42 These amended grounds of appeal are as follows:

"(i) The Tribunal erred in that it misconstrued paragraph (a) of the definition of 'research and development activities' in s 73B (1) of the [Income Tax Assessment Act 1936](#) by:

...

(d) holding that a project may be a research and development activity even though it is a mixture of activities, some of which do and some of which do not fall within the statutory definition of 'research and development activities' [Decision paragraph 26(g)];

(e) determining that the definition did not require a consideration of 'activities' as such but could be construed as applying to a 'project' as a whole without considering each activity which was claimed to fall within the terms of the definition and determining whether each such activity satisfied the terms of the statutory definition [Decision paragraph 26(h)];

...

(iii) The Tribunal erred by failing to consider and apply s 39L of the [← Industry Research and Development Act 1986](#) [→](#) which required the Tribunal to consider whether 'particular activities' that had been carried on by or on behalf of the respondent were research and development activities within the meaning of s73B (1) of the Income Tax Assessment Act 1936-1995."

43 In its written submissions the IRDB submits that it was necessary for the purposes of s 39L of the IR&D Act for the AAT to identify when particular activities had been carried on by C&A. Senior counsel for the IRDB did not elaborate on this submission orally. I reject the submission. Section 39L does not expressly require that a certificate under it identify when the particular activities referred to in it were carried on and I do not think that such a requirement is implied. "Particular activities" are able to be identified in a certificate under the section without a reference to time or to a year of income. It is possible for a certificate under the section to serve its purpose on the basis that the timing of the particular activities referred to in it and, perhaps more significantly, of the taxpayer's expenditure on them, will be left to the Commissioner to determine.

44 The IRDB makes the following key submission:

*" ... the Tribunal said that the 'first question to ask is whether the applicant's **project involved** systematic and investigative activities' Rather, the first question for the Tribunal was whether each **particular activity was**, in fact, systematic, investigative or experimental".*

The IRDB submits that the AAT made no specific findings that the respective Construction, Dewatering and Blasting and Mining activities were systematic, investigative or experimental activities, because it was applying the wrong test, namely, whether the project as a whole, and comprising a mix of activities, 'involved' system, investigation or experimentation. In response C&A submits that on a fair and reasonable reading of its Reasons for Decision, the AAT did address separately the three activities of Construction, Dewatering and Blasting and Mining and used the word "project" namely as a convenient means of referring to all three.

45 The question before the IRDB under s 39L of the IR&D Act was whether it should give to the Commissioner a certificate stating that "particular activities" were research and development activities, that is, whether particular activities satisfied the definition of "research and development activities" in subs 73B(1) of the ITAA 36. Accordingly, in terms of the first limb of that definition, the question is whether there were particular systematic, investigative or experimental activities that "involved" innovation or technical risk and were carried on for one or other of the two purposes identified in par 73B(1)(a). The starting point is that "particular" activities must be identified.

46 The AAT's Reasons for Decision contain many references to "project" and to "activity" or "activities". Taken literally, some of the references to "project" are apt to cause concern since they could be taken to suggest that an entire project can be regarded as a "particular activity", and would therefore satisfy the statutory definition provided only the project "involved" innovation or technical risk carried on for either one of the purposes described in par 73B(1)(a). The IRDB refers to the following paragraphs in the AAT's Reasons for Decision (in each case the emphasis is mine):

*"... **a project** may be eligible even though it is a mixture of activities some of which do and some of which do not meet the legislative requirements" (par 26(g))*

*"In considering a claim for the development of a particular technology it is necessary to have regard to **the whole project** which involved activities prior to and subsequent to the relevant year... Accordingly, it follows that segmenting the **overall project or activities in question** is contrary to the general proposition that eligibility applies to activities as a whole or, in commercial terms, to a **project**." (par 26 (h))*

*"The first question to ask is whether the applicant's **project** involved systematic and investigative activities. There was no real dispute that all three activities in question were carried out in accordance with a plan or organised method. They were certainly not haphazard. The pre-arranged plan envisaged the various stages of construction prior to de-watering and blasting. The six main parts of the construction program involved (1) the construction of a platform, (2) the trenching, (3) the mixing and placing, (4) the connection with the levee, (5) testing and (6) instrumentation. Not only was this **project** systematic, it involved investigative activities. As will be seen later in these reasons, there were unknown areas at the commencement of the activities which had to be explored and investigated in a systematic manner." (par 39)*

"The next question to be asked is whether the **project** involved innovation" (par 40)

"It is not a correct way to approach a claim by analysing individual segments and individual tools used in separate sections of the **project**. Innovation should not be given a narrow meaning. It should be given a broad construction in order to promote the objects of the Act." (par 41)

"The principal reason why the **project** may be regarded as innovative is because there was no precedent for the construction of such a wall through coal and the applicant was intent upon ascertaining whether the activities would succeed and provide a general model for further similar activities to be carried out in respect of other alluvial coal mines owned by the applicant." (par 42)

"The fact that the '**whole thing**' was generally regarded as innovative is attested to by the fact that it was the subject of various papers of a learned kind at important conferences." (par 43)

47 Notwithstanding the AAT's dangerous frequent departures from the legislation's term ("activities") in favour of "project", I think it clear that the AAT applied the definition's criteria to the three categories of activity in dispute: Construction, Dewatering, and Blasting and Mining. The project as a whole included, in addition to the three activities in dispute, "Investigation and Design", yet the AAT did not treat the entire project as qualifying merely because the Investigation and Design part qualified. Similarly, the AAT distinguished between Construction which it regarded as a core activity and Dewatering and Blasting and Mining which it did not but which it regarded as supporting activities, and did not treat the latter as qualifying for no more reason than that it determined that Construction qualified. These considerations show that the AAT did not simply treat the entire four stage project as a single "particular activity" for the purposes of the definition.

48 I accept, in terms of ground of appeal (i)(d), that it would betray error for the AAT to say, as it said in subpar 26(g) of its Reasons, that "a project may be eligible even though it is a mixture of activities some of which do and some of which do not meet the legislative requirements", if the AAT was using the word "activities" in the sense of the "particular activities" to which s 39L of the IR&D Act refers. But the AAT did in fact consider separately the categories of Construction, Dewatering, and Blasting and Mining. I will

return to this point below.

49 I agree as stated in ground of appeal (i)(e), that it was wrong for the AAT to say, as it said in subpar 26(h) of its Reasons, that the definition did not require consideration of each particular activity claimed to fall within its terms and that eligibility applied to "the overall project or activities". But again, the AAT did in fact consider separately the categories of Construction, Dewatering and Blasting and Mining. I will also return to this point below.

50 Ground of appeal (iii) (that the AAT erred by failing to consider whether "particular activities" satisfied the definition of "research and development activities" in subs 73(B)(1)) is in terms apt to raise the question whether each of Construction, Dewatering and Blasting and Mining was a "particular activity" for the purposes of s 39L of the IR&D Act. However, this is not the thrust of the IRDB's submission which concentrated on the "project as a whole" argument.

51 At the heart of the IRDB's submission seems to be the idea that "the project" here comprises all four elements (Investigation and Design; Construction; Dewatering; and Blasting and Mining) and that the definition was not intended to encompass such a project, as distinct, for example, from an investigation and design which included the construction of a model. Three observations should be made at the outset. First, C&A's claim was not in respect of all its pre-mining expenditure on the Alluvial Lands Project, although it does seem that the items omitted from its claim were proportionately small.

52 Secondly, although the project may appear to be costly (see below), its cost was bound to be substantially less than the value of the coal, the mining of which it made possible (see below). That is, the four-stage project itself was only the first stage of the yet greater project which included the mining of the reserves of coal for sale (the reference to "Mining" in the expression "Blasting and Mining" is not a reference to the mining of the coal for sale but only to the mining of coal which was encountered and had to be removed as an incident of the construction of the wall).

53 Thirdly, while the use of the word "particular" in s 39L of the IR&D Act is no doubt intended to confine in an ill-defined way the scope of the activity to which the definition in subs 73B(1) of the ITAA 36 is to be applied, yet that particular activity need be only a systematic, investigative or technical activity that **"involves"** innovation or technical risk. Of the various dictionary definitions of the verb "involve", there are two that claim attention here:

The more liberal meaning

"**3** To include, contain or comprehend within itself or its scope" (The Macquarie Dictionary, 2nd revised ed 1987)

"**5 ... b** Include, contain, comprehend" (The New Shorter Oxford English Dictionary, 1993)

The more limited meaning

"**1** To include as a necessary circumstance, condition or consequence; imply; entail" (The Macquarie Dictionary, 2nd revised ed 1987)

"**5 ... c** Contain implicitly; include as essential; imply, call for, entails." (The New Shorter Oxford English Dictionary, 1993)

According to either meaning, an activity, although it must be "particular", is not disqualified by reason only of the fact that in some respects it does not involve innovation or technical risk.

54 I think that the more liberal meaning is the one invoked by the definition. This seems to be in accord with the approach taken by the Full Court in *Unisys* and with the Act's object of encouraging research and development activities. Moreover, the more limited meaning is applicable where the word "involved" is used in relation to an abstract concept, as in "construction involves work" or "power involves corruption". But even if the more limited meaning is in some way the applicable one, I think the AAT was entitled to find it satisfied because the evidence accepted by the AAT showed that innovation and technical risk characterised Construction throughout.

55 Against the above background, it is useful to understand how the four categories came to be identified.

56 In late 1994, C&A applied for an advance ruling on its project titled "Mining of Alluvial Lands". The project was described by C&A over thirty-eight pages. The alluvial lands were said to contain 35,000,000 tonnes of coal reserves. Although there were references to investigations that had been carried out already, the reasons why soil-bentonite technology had been chosen as a means of preventing ground water flowing into the mining area, construction of the cut-off wall and levee bank, dewatering, and the testing of the effect of blasting of the wall, the document did not divide the activities up into the four categories with which we are concerned. The document stated that construction had begun in early 1994 and was still in progress; that construction and "dewatering of the entrapped aquifer" would be completed before mining was scheduled to commence in June 1995; and that completion of mining and rehabilitation were scheduled for 2005.

57 On 1 March 1995, the IRDB decided adversely to C&A's request because, it said, of lack of sufficient evidence that the definition in subs 73B(1) of the ITAA 36 was satisfied, and on 22 March 1995 it advised C&A accordingly.

58 On 27 November 1995 and 20 June 1996, C&A applied for registration under s 39J of the IR&D Act in respect of the calendar years 1994 and 1995 respectively, supplying particulars of the project for the purpose (interestingly, the IRDB's printed form of application for registration used both the words "project" and "activity"). In the first form, the "total R&D expenditure" for the project was shown as \$12,270,372.39, and in the second form it was shown \$11,576,873.58.

59 The IRDB treated the applications for registration as notifications of claims and on 1 August 1996 it wrote to C&A forwarding its officer's "draft R&D assessment report" and inviting comments. The IRDB officer's draft identified the "main activities" of C&A's project as the four ((1)(a)-(e), (2), (3) and (4)) referred to earlier. From that time, both C&A and the IRDB appear to have conceived of those four activities as the "particular activities" to be assessed. In his draft, the officer expressed the opinion that activities (1)(c), (d) and (e) qualified as core (par (a)) activities; activities (1)(a) and (b) qualified as supporting (par (b)) activities; and activities (2), (3) and (4) were neither core nor supporting activities.

60 Apparently C&A's consultants, Michael Johnson & Associates, responded on 26 August 1996.

61 On 2 October 1996 the IRDB decided in accordance with the officer's draft report and on 18 October 1996 it wrote to C&A advising C&A of its decision.

62 After obtaining an extension of time for the purpose, on 10 January 1997, C&A's consultants wrote to the IRDB requesting that it reconsider its decision. In their letter, the consultants addressed certain reasons that had been given by the IRDB for its decision in its letter of 18 October 1996. After referring to their letter of 26 August 1996, they stated:

"To reiterate, core activities during the construction stage included conceptual work to overcome changes in geological conditions and design revisions of the cut-off wall and levee to deal with changing conditions and to overcome problems such as excessive settlement and construction difficulties.

In the mining stage of this project a substantial amount of core research has been directed at determining the effects of blasting on soil-bentonite liquefaction. This research is being conducted both in a laboratory and field environment.

In relation to the supporting activities associated with the mining stage of the project, Coal & Allied does not intend to make any claim for activities which are strictly mining. Coal & Allied does however, intend to claim costs associated with the development of end wall slots to detect possible leaks in the alluvium prior to mining. In addition, it is anticipated that approximately six blast shots will be necessary to establish acceleration effects on soil-bentonite liquefaction which could cause cracking in the wall."

Generally, the submission sought to convince the IRDB why the technical viability of the project "could only be assessed through construction of the cut-off wall and levee, dewatering, blasting and end wall slot development."

63 C&A supplied a lengthy document (fifty-one pages) dated 25 February 1997 supplying a detailed account of the activities involved in the project (the document stated that the development of the cut-off wall and levee bank to act as a total barrier against flood and general water flows, would allow in the first instance, "22,000,000 tonnes of previously inaccessible coal" to be mined and exported). Annexure A to the document was a table that identified thirty-four activities involved in the project and when they had occurred or were scheduled to occur. In relation to twenty-six of these activities, C&A stated in the table that they had been claimed or that aspects of them were potentially claimable. It stated that there was no intention to claim in respect of the remaining eight activities.

64 There was a site visit by representatives of the IRDB on 25 February 1997 at which further information from C&A was requested.

65 On 16 June 1997 C&A's consultants wrote to the IRDB enclosing a document dated 12 June 1997 giving reasons why some of the activities should be regarded as "core activities" and others as "supporting activities".

66 The TCC's officer recommended that the TCC's decision of 2 October 1996 be confirmed with the qualification that the liquefaction study also be allowed as a supporting activity.

67 On 7 August 1997 the IRDB resolved in accordance with the recommendation. Accordingly, the confirmatory decision, like the original one of 2 October 1996, was expressed in terms of the categories and sub-categories of activity of present concern. On 12 August 1997, the IRDB wrote to C&A's consultant and to the Commissioner advising them of its decision (the letter to the Commissioner was also the IRDB's certificate under s 39L of the IR&D Act).

68 Before the AAT there was testimony in the form of witness statements and oral testimony of the six witnesses referred to in par 18 earlier. All those witnesses were led to give evidence by reference to the categories of activity with which I am concerned. Moreover, the testimony of the five witnesses called by C&A was able to support a conclusion that those categories of activity bore throughout the relevant

quality. That is to say, not only did the parties throughout proceed on the footing that the nominated categories of activity were ones to which the statutory criteria could appropriately be applied, but there was expert testimony before the AAT to that effect, that is, accepting that the categories were not inappropriately broad.

69 The IRDB submits that the AAT's concern with C&A's project led it not to apply the "systematic, investigative or experimental" criterion separately to each of the three activities in question. I disagree. The relevant paragraph from the AAT's reasons is as follows:

"39. The first question to ask is whether the applicant's project involved systematic and investigative activities. There was no real dispute that all three activities in question were carried out in accordance with a plan or organised method. They were certainly not haphazard. The pre-arranged plan envisaged the various stages of construction prior to de-watering and blasting. The six main parts of the construction program involved (1) the construction of a platform, (2) the trenching, (3) the mixing and placing, (4) the connection with the levee, (5) testing and (6) instrumentation. Not only was this project systematic, it involved investigative activities. As will be seen later in these reasons, there were unknown areas at the commencement of the activities which had to be explored and investigated in a systematic manner."

70 In the second, third and fourth sentences of this passage, the AAT held expressly that each of the three activities was systematic. Although it does not matter (because "systematic" and "investigative" are true alternatives), I also think that on a reasonable reading, in the last two sentences the AAT also held that each of the three was an investigative activity. The second last sentence is that the project, noted in the first and second sentences to involve the three activities, was of an investigative character.

Amended grounds of appeal (i)(a), (f) and (ii) - "Innovation"

71 These amended grounds of appeal are as follows:

"(i) The Tribunal erred in that it misconstrued paragraph (a) of the definition of 'research and development activities' in s 73B (1) of the [Income Tax Assessment Act 1936](#) by:

(a) holding that an activity may be 'innovative' because it is the first example of the large scale use of certain processes [Decision paragraph 26(d)];

...

(f) holding that, in the context of the section, innovation cannot mean only activities involving the use of new processes [Decision paragraphs 26(i) and 42] (and, impliedly, holding that if a product is new then it can be inferred that the whole of the processes by which the product was created involved innovation or technical risk).

(ii) ... the Tribunal erred in failing to consider and assess the necessary qualitative element in the statutory concept ... of:

(a) innovation, ... "

72 Paragraph (a) of subs 73B(1) of the ITAA 36 makes innovation and technical risk alternatives to each other. Accordingly, the AAT's conclusion that Construction was within the first limb of the definition is

unassailable if its finding as to either one of them is unassailable.

73 The IRDB also submits that the AAT erred in holding that the statutory test for innovation is satisfied where the activity is shown to be the first large scale use of certain processes, whereas what is required is a certain qualitative element being a novel feature or aspect of the activity. It submits as follows:

*"To hold that 'innovation' is satisfied if an aspect of a project (construction) is the first example of use of certain processes is to fail to appreciate the **qualitative** element which the context of the legislation imparts to add colour to the meaning of the term."*

*"The fact that something is a 'first' does not make it innovative. If it is the **manner** in which techniques or processes are combined that is the innovative element, it is essential that that should be the subject of a finding of fact".*

The IRDB relies on the patent context in which novelty is held to involve not mere "newness" but a degree of inventive quality or ingenuity.

74 In response, C&A submits that the AAT did identify construction activities that were innovative; that the introduction of a nebulous requirement such as a "qualitative element" is inconsistent with the dicta found in *Unisys*; and that the importation of the concept of novelty as it is understood in patent law is not warranted.

75 Since the AAT held that Construction, but not Dewatering or Blasting or Mining was a core activity, I will deal with the present issue only in so far as it relates to Construction.

76 As noted earlier, the AAT noted the IRDB's submission that any innovative activity took place during the Design stage and had concluded prior to the Construction phase, but it preferred the testimony led by C&A to the effect that "[d]esign was not concluded when construction began". The AAT identified particular problems which necessarily had to be addressed by the contractor and project team during the Construction phase and which could not have been addressed during the Design stage.

77 In ground of appeal (i)(a) the IRDB attacks the AAT's statement that "an activity may be innovative because it is the first example of the large scale use of certain processes". Counsel for the IRDB submits that the proper relevant question is whether the fact that an activity was the first example of the large scale use of certain processes constituted innovation on the facts of the particular case. I agree that a new largeness of scale, without more, does not necessarily point to innovation. The question raised by the present ground of appeal is therefore whether the AAT found innovation consisting of nothing more than the fact that C&A's contractor made large scale use for the first time of certain already known processes. As will appear, I think that it did not.

78 The AAT began its consideration of the issue of innovation by finding, on the basis of the testimony led by C&A, that design was not concluded when construction began, and that particular design problems and issues necessarily had to await Construction. The AAT referred to five of these problems, which I will not set out here. Then the AAT accepted C&A's submission, and the testimony of its witnesses, that the use in combination of machinery commonly used in engineering works, **in the circumstances and for the purpose in question, in the present case, was innovative**. Importantly for present purposes, the AAT thought that consistently with *Unisys*, "innovation" was to be given a broad construction which made it unnecessary to find innovation in "individual segments and individual tools used in separate sections of the project".

79 The AAT expressly identified aspects of the construction activities which it said were innovative, including:

(i) combining existing engineering methods and machinery in a novel way to overcome the formidable problems of trenching through coal and alluvial rock;

(ii) the very construction of the cut-off wall and levee bank, because the project represented the first installation of a slurry trench and soil bentonite cut-off wall through coal in Australia and, indeed, the world;

(iii) the fact that the construction involved a series of "indisputable firsts" (the first soil-bentonite slurry wall excavated with a long reach excavator in Australia, the first soil-bentonite slurry wall cut-off for coal mine de-watering control in the world, the first soil-bentonite slurry wall through coal in the world), and other innovative features, including the use of instruments not ordinarily applied to soil bentonite cut-off walls.

(The AAT erred factually in stating that one of the four common engineering methods was "hydro-fraises" because, although extensive consideration was given to using them, in the event they were not used, but this factual error is not of significance.)

80 In *Unisys*, a Full Court of this Court accepted (at 559) that the word "innovation" in par 73B(1)(a) meant:

"something new or different introduced"

and

"the act of innovating: introducing of new things or methods"

for which it cited *The Macquarie Dictionary*.

81 I think that this statement by the Full Court accorded to the word "innovation" an ordinary and broad meaning rather than a narrower technical one, such as one having an affinity with the meaning with "innovation" in the law relating to patents of invention.

82 In my opinion, the AAT correctly understood and applied the concept of innovation which the definition imports and its conclusion that the Construction activity involved innovation is not shown to have been infected by error.

Amended grounds of appeal (i)(b), (c) and (f) and (ii) - "Technical risk"

83 These amended grounds of appeal are as follows:

"(i) The Tribunal erred in that it misconstrued paragraph (a) of the definition of 'research and development activities' in s 73B (1) of the [Income Tax Assessment Act 1936](#) by:

...

(b) holding that 'technical risk' meant 'uncertainty as to outcome' pertaining to 'an art, science or the like' [Decision paragraph 26(e)] and that technical risks may be involved because there is uncertainty as to practical outcome and whether the end product could be processed and sold commercially [Decision paragraph 26(f)];

(c) holding that an activity may involve technical risk because while there was little risk in the technology itself, there was induced risk in the attempt to apply it [Decision paragraph 26(e)];

...

(f) holding that, in the context of the section, innovation cannot mean only activities involving the use of new processes [Decision paragraphs 26(i) & 42] (and, impliedly, holding that if a product is new then it can be inferred that the whole of the processes by which the product was created involved innovation or technical risk).

(ii) ... the Tribunal erred in failing to consider and assess the necessary qualitative element in the statutory concept ... of :

...

(b) technical risk."

84 As noted earlier, par (a) of subs 73B(1) of the ITAA 36 makes innovation and technical risk alternatives to each other so that it sufficed that the Construction activity involved either one.

85 The IRDB claimed that the AAT erred in formulating the test of "technical risk" in terms of a "mere 'uncertainty as to outcome' " and submits that the expression requires a realistic risk of failure.

86 The IRDB relies on the Full Court discussion of "technical risk" in *Unisys* in the which the Court accepted (at 559) that *The Macquarie Dictionary's* definition of "risk",

"exposure to the chance of injury or loss; a hazard or dangerous chance"

was applicable.

87 The IRDB further submits that particular technical problems encountered in the installation of a slurry trench and soil bentonite cut-off wall through coal, which may be resolved through the application of standard engineering methods, are not to be equated with the notion of "technical risk". Finally, as in respect of the term "innovation", the IRDB submits that the AAT erred by failing to form a required qualitative judgment about the meaning of "technical risk".

88 C&A submits that the AAT approach to the notion of "technical risk" was consistent with that of the Full Court in *Unisys*. It submits that "uncertainty as to outcome" is at the heart of the concept and that by its submission the IRDB is inviting the Court to narrow the ordinary meaning of the notion, contrary to the approach endorsed by the Full Court.

89 The IRDB referred me to documents which preceded the commencement of construction with a view to demonstrating that all eight of the risks identified by Mr Davidson had been anticipated, so that the surmounting of them in the Construction stage was no more than an outworking of the earlier Design stage. It is convenient to note those documents as follows:

Date	Author	Document
24/11/92	AGC Woodward-Clyde Pty Ltd	"Review of Proposal to Construct a Slurry Cut-off Wall" (feasibility study)
March	Gutteridge Haskins & Davey Pty Ltd	"Proposal for Levee and Cut-off Wall Design for

93		the Alluvial Lands"
July 93	John Capsanis, C&A's Co-ordinating Engineer, Alluvial Lands	"Cutoff Wall Overseas Investigations for the Alluvial Lands"
17/8/93	Gutteridge Haskins & Davey Pty Ltd	"Pre-qualification of Contractors for Tender Purposes"
5/12/93	Woodward-Clyde Consultants	Technical Audit of GHD's Cut-Off Wall Design
21/3/94	John Holland Construction & Engineering Pty Ltd	Construction Contract
	and C&A	

The following activity and documents may be added to this chronological account:

14/3/94 - 30/6/95 CONSTRUCTION WORK TOOK PLACE

Sept 94	Gutteridge, Haskins & Davey Pty Ltd	"Cut-Off Wall and Levee Bank Design Report"
Undated but after	Gutteridge, Haskins & Davey Pty Ltd and Minemco P/L	"Project Completion Report"

30/5/95

90 There was a considerable volume of written and oral testimony before the AAT. In particular, in the course of his cross-examination Mr Davidson of Woodward-Clyde elaborated on the eight technical risks he had described in his affidavit. In relation to the first technical risk, his evidence was that there was the possibility of greater settlement of the wall during the Construction phase, with the risk of cracking and seepage, than had been, or could have been, revealed by the testing and modelling carried out in the Design stage. For this reason, he said, monitoring by instrumentation and visual inspection, was required. Moreover, he said that the designer had to be "very involved in the monitoring" in order to be able to make decisions as construction work progressed.

91 In relation to the second technical risk, he explained that there was the possibility of the development of defects within the wall. A borehole camera was used as a safeguard against such a development. He stated as follows:

"In this particular case, however, the ability to actually monitor was far less reliable and in many ways the real test of the performance would only come once the wall was completed and the wall or the excavation was made and de-watering was created at the loading across the wall. So it's true that every step I think and in fact even somewhat of an extraordinary effort was made to try to, to minimise that risk. But it certainly did not disappear because there have been many cases in the literature and in my experience where even with good efforts defects remain in walls and so this was one of the cases where they, they sort of went the extra mile to try to minimise that, that potential risk."

Mr Davidson said that seepage under the wall was in fact detected and the problem was "managed by way of additional de-watering".

92 In cross-examination Mr Davidson referred to the third technical risk as one of "high permeability". He

said that there was a risk "that the backfill would be too coarse or gap-graded producing an unacceptably high permeability". He said that while he agreed that this risk had been thought about during the Design phase, it could not be eliminated and therefore it remained necessary to "watch" and "observe" because there was always "a reasonable risk that some of those high permeability zones might be present".

93 The fourth technical risk was described as the risk of "incompatible filter behaviour". He said that the task was to match the backfill gradation so that it was "filter compatible" with the surrounding soil mass. He said that it was necessary for the designer to make site adjustments "as they went" and that it was necessary for the designer to be "on site". He agreed that while the risk had been thought about by the design team during the Design phase, there was always the risk that the designer's predictions would turn out to be quite wrong.

94 The fifth technical risk related to the excavatability of the sedimentary cap rock above the coal. In his written statement, Mr Davidson said:

"It was exposed in outcrop as a hard zone that could have significantly impeded excavation progress with backhoe or clamshell. I had been involved with a number of projects where rock at the base of the excavation caused major delays and claims. ... As it turned out, the cap rock was readily excavated with clamshell and chisel and was a non-issue. This demonstrates the uncertainty inherent in underground construction and our inability to anticipate actual conditions precisely in design."

95 The sixth technical risk related to the excavation of coal out of the trench. Mr Davidson stated that to his knowledge the project was the first slurry wall ever constructed through coal. He said the excavation of the coal turned out to be a far more serious problem than had been anticipated at the Design stage. He said that the anticipation was that once the cap rock had been penetrated, excavation by clamshell, with chisels to break up harder zones, would be satisfactory. In the event, however, this "turned out to be completely wrong" because the coal was too hard to be excavated with backhoe or clamshell, and "the chisel just bounced off the compressible coal". Although there had been some indications at the Design phase that there might be a problem calling for auger drilling, it was not known that this would occur. Mr Davidson said:

"We spent many hours brainstorming solutions with the contractor including mobilizing a hydrofraise-type cutter from Singapore or Seoul ..., blasting and decompression drilling with an auger"

He said that none of these methods had ever been previously used in coal and there was a concern that, if they were unsuccessful, the project would have been jeopardised. Accordingly, a "trial and error approach" was adopted. He explained that the contractor trialled different approaches and had "reasonable success with the auger drilling". Auger drills could be easily mobilised from Sydney and were the "first port of call" because hydrofraises were expensive and had to come from overseas. He said in cross examination that what was done was that on a trial and error basis, known techniques were used in untried combinations in an untried material.

96 In relation to the seventh technical risk, Mr Davidson stated that there was a significant risk of loss of excessive slurry into the surrounding alluvial soils. He said:

"This risk could only be assessed during construction by observation, and then attacked by adjusting the bentonite content, using additives, changing bentonite and implementing a contingency plan if necessary."

He said, however, that it transpired that slurry loss was not a problem.

97 In relation to the eighth and final technical risk, trench instability, Mr Davidson agreed that this risk had been considered in the Design phase but that careful construction and monitoring were necessary during Construction to ensure that the problem considered did not eventuate. In the event, while there was "some enlargement at the top of the wall", it was "not a significant problem".

98 In my respectful opinion, what I have said above and earlier about Mr Davidson's eight technical risks shows that there was ample evidence before the AAT that the Construction activity was attended by risks and that those risks were of a technical nature. It is not the point that it was possible to conceive at the Design stage of an area of potential difficulty in the later Construction stage. There remained uncertainty as to whether what was to be tried at first would succeed. If it did not as in the case of the attempt to excavate coal by the use of a backhoe or clamshell, there was the risk of delay and extra cost while an alternative was found. No doubt the extent of exposure to potential loss varied as between risks.

99 I do not think the AAT is shown to have erred in its understanding and application of the concept of "technical risk".

Amended grounds of appeal (iv) and (v) - Supporting activities

100 These amended grounds of appeal are:

"(iv) The Tribunal misconstrued paragraph (b) of the statutory definition of 'research and development activities' (the second limb of the statutory definition) in relation to the meaning of the words 'carried on for a purpose directly related to the carrying on of activities of the kind referred to in paragraph (a)]' of the statutory definition by holding that the reference to 'a purpose' instead of 'the purpose' indicated that a subsidiary, collateral or subordinate purpose rather than an actuating purpose was sufficient [Decision paragraph 57].

(v) The Tribunal erred in determining that certain activities (dewatering and blasting activities) could qualify as 'supporting activities' satisfying the second limb of the statutory definition when it was not open to the Tribunal to make that determination by reason of the fact that:

(a) those 'supporting activities' did not occur until after the completion of the 'core activities'; and

(b) no factual findings were made as to how those supporting activities were carried on for a purpose 'directly related' to the carrying on of particular activities falling within paragraph (a) of the statutory definition."

101 In relation to the AAT's conclusion as to the supporting activities, the IRDB submitted, firstly, that the AAT's finding was unsustainable if its foundation finding that the Construction activity was a core activity is flawed. It also submitted that the Dewatering and Blasting and Mining activities both occurred after construction of the wall and levee, and cannot therefore be considered to have been carried on for a purpose "directly related" to the "carrying on" of the core activities. That is, it submits that the second limb of the statutory definition imports a temporal connection.

102 The IRDB finds fault with an earlier AAT decision in *Re Charles IFE Pty Ltd and Industry Research and Development Board* (1995) 95 ATC 2149 ("*Charles IFE*"). The AAT there held

that any activities which were in some way inputs to, or of assistance to, core activities were necessarily within the category of supporting activities. The IRDB submits that this view ignores the requirement of a "direct" relationship which purposively relates to the carrying on of core activities. The AAT's decision in *Charles IFE* was in fact set aside by Heerey J in accordance with consent orders made on 3 April 1997. In short, the IRDB submits:

"In order to achieve the goals of the tax concession and in the context of the statutory definition as a whole, paragraph (b) of the statutory definition should be construed as requiring a major or actuating purpose of the particular (identified) supporting activity to be to facilitate the achievement of the (identified) core activity".

103 Having regard to its conclusion that of the three activities that it was considering, Construction satisfied par (a) of the definition in subs 73B(1), the question before the AAT in relation to Dewatering and Blasting and Mining was whether, in terms of par (b) of the definition, those activities were "carried on for a purpose directly related to the carrying on of [the Construction activity]". I agree with the AAT that the use of the article "a" in par (b) indicates that the purpose specified in the paragraph need not be the "sole" or "dominant" or "actuating" purpose, and that it is sufficient that it was simply "a" purpose of the activity in question.

104 Although, as noted earlier, the AAT referred to the *Charles IFE* case early in its Reasons when setting out certain general statements of principle which it thought could be discerned from earlier cases, I do not think that when considering Dewatering and Blasting and Mining the AAT applied a test derived from *Charles IFE* ("activities which were in some way inputs to or of assistance to accepted core activities").

105 The AAT made findings of fact that one purpose of Dewatering was to determine the integrity and performance of the cut-off wall. This finding meant that one purpose of Dewatering was directly related to both the original Design phase activity and the later design activity carried on in the course of the Construction phase. After describing the way in which the Dewatering activity enabled the drawing of conclusions about the integrity and performance of the cut-off wall, the AAT stated (at [59]):

"Although the primary purpose of de-watering the area was to facilitate coal extraction, a subsidiary purpose which, in my view, falls within the terms of the definition, was to determine whether the soil-bentonite cut-off wall technology could be used to reduce seepage and facilitate coal extraction elsewhere and to assist directly in the supplementary design work embodied in the construction."

106 I do not think that the finding of fact in this passage is assailable by reason of the fact that the Dewatering post-dated the original Design phase or even the design activity forming part of the Construction activity. One activity can be carried on "for a purpose directly related to" the carrying on of another activity even though that other activity is completed by the time the activity in question begins.

107 The IRDB submits that the AAT erred in thinking that the use of the indefinite article "a" instead of the definite article "the" probably indicated "a subsidiary, collateral or subordinate purpose, rather than an actuating purpose". The IRDB points out that substitution of "the" for "a" in par (b) of subs 73B(1) is syntactically impossible. I agree that restructuring of the language is not straight forward but it would have been possible, for example, along the lines:

"Other activities that are carried on for the direct purpose of the carrying on of

activities of the kind referred to in paragraph (a)."

Be this as it may, "a" does not mean "the", and limiting work is performed by the word "directly".

108 I do not accept that par (b) is to be construed as requiring that "a major or actuating purpose of the particular (identified) supporting activity be to facilitate the achievement of the (identified) core activity" as IRDB submits. However, as the IRDB submits, it is required that the activity in question be carried on for a purpose "**directly related**" to the carrying on of a core activity. I think that the AAT was entitled to be satisfied that this test was met by the Dewatering activity in the present case.

109 Similarly, in relation to the Blasting and Mining activity, the AAT was entitled to find this activity was also directly related to the activity comprised in the Design phase or in the ongoing design involved in the Construction phase. The AAT found that blasting was carried out for purposes of testing the integrity of the wall and levee bank as constructed to ensure that mining of coal for sale and associated blasting could be safely carried on, and to develop an understanding of the effect of future mining on the soil-bentonite mix. Again, although the timing of the blasting (not earlier than April 1996) might be one factor to be taken into account in determining the directness of the relationship between it and the core activities, I do not think that the suggested "lateness" of the blasting disentitled the AAT to arrive at the factual conclusion that it was directly related to the core activities mentioned.

Amended ground of appeal (vi) - inadequacy of reasons for decision

110 This amended ground of appeal is as follows:

"(vi) The Tribunal erred in that it failed to make findings on material questions of fact and failed to give adequate reasons for its decision as it was required to do by [s 43\(2B\)](#) of the [Administrative Appeals Tribunal Act 1975](#)."

111 The IRDB submits that if it be thought that the AAT may have had the correct approach in mind, nonetheless it failed to comply with the obligation imposed on it by subs 43(2B) of the AAT. The IRDB submits:

"The reasoning of the Tribunal in this matter was superficial, amounting to little more than a cut and paste approach to the evidence of the various witness (primarily their witness statements)."

112 The IRDB seeks to derive support from the consent directions made by Heerey J in the *Charles IFE* case by which the matter was remitted to the AAT to be heard and decided in accordance with the directions. The IRDB submits that those directions would not have been satisfied by the AAT's Reasons for Decision in the present case. I am not persuaded to think that the AAT's Reasons for Decision in the present case necessarily fail to satisfy the requirements of subs 43(2B), merely because they may not, in some respects, have attained the standard represented by the consent directions made in the *Charles IFE* case.

113 [Section 43](#) of the [AAT Act](#) provides that the AAT must give reasons for its decision and subs (2B) of that section provides as follows:

"(2B) Where the Tribunal gives in writing the reasons for its decision, those reasons shall include its findings on material questions of fact and a reference to the evidence or other material on which those findings were based."

114 In summary, the AAT made the following findings on ultimate statutory questions of fact that were material to its conclusions that Construction was a core activity and Dewatering and Blasting and Mining were supporting activities:

- (1) that the Construction activity was systematic and investigative;
- (2) that the Construction activity involved innovation;
- (3) that the Construction activity involved the eight technical risks identified by Mr Davidson;
- (4) that the Construction activity was carried on for the dominant purpose of: "*acquir[ing] new knowledge by way of ascertaining whether the construction of a soil-bentonite cut-off wall with a connected overlapping levee bank in the context of a maximum hydraulic gradient exceeding 30 was a cost-effective way of isolating underground and ground waters to enable open-cut mining of alluvial coal to take place*"

and also for the purpose of "*creating a new or improved process or method for isolating underground and ground water to enable open-cut mining of alluvial coal to take place, ...*";

- (5) that the Dewatering and Blasting and Mining activities were carried on for a purpose directly related to the carrying on of the Construction activity.

115 In support, the AAT made findings of primary fact and referred to the following "evidence or other material" on which it based its findings:

Ultimate Finding 1

116 The RRT noted that there was "no real dispute that all three activities in question were carried out in accordance with a plan or organised method". It then referred to the six-staged nature of Construction.

117 In relation to the investigative nature of Construction it referred to the non-controversial fact that "there were unknown areas at the commencement of the activities which had to be explored" in the course of construction, as demonstrated later in its Reasons.

118 I do not think that it matters that the AAT did not refer more precisely to testimonial or documentary evidence at this point because it was not controversial that Construction was a systematic activity and the AAT later in its Reasons referred to the evidence of the "unknown areas ... which had to be explored in the course of construction" as showing that it was also an investigative activity.

Ultimate Finding 2

119 The AAT relied expressly on the evidence of Dr Truscott, Mr Davidson and Mr Cavalli and implicitly also on that of Professor Filz and Mr Capsanis.

Ultimate Finding 3

120 The AAT relied expressly on the evidence of Mr Davidson, and implicitly also on that of Dr Truscott, Mr Cavalli, Professor Filz and Mr Capsanis.

Ultimate Findings 4 and 5

121 These two findings were as to the purposes of Construction (Finding 4) and Dewatering and Blasting

and Mining (Finding 5). The AAT said that it found the evidence of Mr Capsanis "especially useful for demonstrating the presence of the requisite purpose".

122 The AAT stated that it preferred the testimony of the five C&A witnesses to that of the IRDB's witness and gave reasons for that preference. I think it implicit, having regard to the nature of the expertise of the five witnesses called by C&A, that the AAT based its findings on the testimony of all five. It is for this reason that I have used the word "implicitly" above.

123 The AAT also summarised, sometimes briefly, its findings of primary fact and the nature of the evidence relevant to its findings. But it must be remembered that what [s 43](#) of the [AAT Act](#) requires varies according to the nature of the particular case and the issues it raises for decision. The general nature of the respective activities here was not a matter of dispute. What was in dispute was whether they satisfied the statutory criteria. The AAT gave its reasons for thinking that they did.

124 As noted above, in some instances, the AAT expressly linked particular areas of evidence to particular witnesses, such as evidence of innovation to Dr Truscott, Mr Davidson and Mr Cavalli, and evidence of technical risk to Mr Davidson. But subs 43(2B) does not require the AAT to attribute each part of its discussion of the facts to a particular evidentiary source.

125 I do not think that the AAT's Reasons for Decision leave the IRDB in doubt as to the reasons why it failed before the AAT. In my view, the AAT's Reasons satisfy the requirements of a provision such as [s 43](#) as recently explained by a Full Court of this Court in *Minister for Immigration and Multicultural Affairs v Singh* [\[2000\] FCA 845](#).

126 I do not think that the present ground of appeal is made out.

Conclusion

127 For the above reasons, the present application will be dismissed with costs.

I certify that the preceding one hundred and twenty-seven (127) numbered paragraphs are a true copy of the Reasons for Judgment herein of the Honourable Justice Lindgren.

Associate:

Dated: 24 July 2000

Counsel for the Applicant: Mr J Basten QC and Mr I Harvey

Solicitors for the Applicant: The Australian Government Solicitor

Counsel for the Respondent: Dr J Griffiths

Solicitor for the Respondent: Gilbert & Tobin

Date of Hearing: 27 April 2000

Date of Judgment: 24 July 2000

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