Title: SHIP LOADING OF BULK MATERIAL

Abstract: The present invention relates to an installation (10) for facilitating the loading of minerals into a marine vessel (80). The installation comprises an onshore slurring facility (20) for fluidising the minerals into a slurry; an offshore separation facility (40) for removing at least some of the fluid from the slurry; a pipeline (23) fluidly connecting the slurring facility to the separation facility; and a pump for conveying the slurry from the slurring facility to the separation facility along the pipeline. The minerals are available for offshore loading from the installation onto the vessel.
Ship Loading of Bulk Material

Field of the invention

[0001] The present invention relates to the ship loading of bulk mineral commodities. More particularly, the present invention relates to an installation for facilitating the loading of a bulk mineral commodity into an ocean-going bulk carrier.

Background of the invention

[0002] Transport of bulk mineral commodities such as iron ore, base metal concentrates, industrial minerals and coal involves physical movement of the materials from the site of extraction to the destination market. Very often, at least one leg of the journey is by ship. In view of the significant tonnages involved, often measured in the 10's to over 100 million tonnes annually from a single loading facility, the ideal environment for loading the material from shore to ship is a natural harbour with deep water (typically a depth exceeding 18-24 m) located very close to the shoreline. The ideal environment is also free of extreme weather and ocean conditions, and located in a relatively remote region with no obvious natural beauty or social/community value. Such an environment offers advantages in terms of minimal environmental impact and reduced capital and operating costs.

[0003] Another desired characteristic is a large available area for stockyards (i.e. a physical buffer storage facility) at or very close to the shoreline to accommodate the high volume/tonnage of bulk material received (typically by rail) from mine sites and other sources.

[0004] Under such ideal conditions, ship loading operations can be conducted cost effectively and on a continuous basis without causing excessive detrimental environmental outcomes. In addition, the port side infrastructure requirements for ship loading in such an environment are relatively minor. The size of the stockyard areas generally remain significant.

[0005] However in practice, such environments rarely exist. This necessitates the development of more complex and potentially environmentally-challenging bulk storage and ship loading facilities. In addition, the bulk
shipment port facilities associated with such loading facilities often compete with other community demands for shoreline use.

[0006] Presently there are four broad categories of shore-to-ship bulk mineral commodity transfer options that are deployed in the absence of an ideal environment, namely:

- Dredging (to a Wharf Facility)
- Draft vessel loading
- Slurrying; and
- Jetty Systems

[0007] Dredging involves the creation of a deep-water berth relatively close to the shoreline where a wharf is constructed. Dredging is also conducted between the berth pocket at the wharf and deep water.

[0008] Access to the wharf (and the vessel for loading) is provided by a jetty or directly through the land between the wharf and the shoreline, typically after the land is backfilled to create a suitable structure. Conveyors are usually employed to transfer the bulk material commodity from the stockyards to the ocean-going bulk carriers.

[0009] The primary issue with this approach is the additional environmental impact of dredging and the subsequent disposal of spoil material. This impact is in addition to any site-specific impacts of the particular shoreline at which the port facilities are located. Increasingly, finding suitable geographical locations in practical proximity to the primary source of the bulk mineral commodity is difficult. Moreover, increasingly stringent environmental regulations are being applied to both dredging operations and the operation of artificial deep water harbours.

[0010] Also, in a great many locations, competition for shoreline locations with other community uses is increasing enormously.

[0011] Draft vessel loading involves loading the bulk mineral commodity by a conventional conveyer or grab system onto a shallow draft vessel, such as a barge. The barge is then towed or motors into deep water from where its contents are offloaded into the ocean-going bulk carrier. In some instances, an intermediate scale trans-shipment vessel will be employed. This method clearly
involves multiple handling at generally high cost. The potential for accidental
discharge of the bulk material into the sea between the shoreline and the final
ocean-going bulk carrier must also be taken into account.

[0012] In a very limited number of cases, direct loading of the bulk mineral
commodity into an ocean-going bulk carrier as a slurry is employed. In these
cases, the ocean-going bulk carrier is specially fitted with internal excess-water-
removal pumps. Once loaded, the solids are allowed to settle under gravity which
enables the supernatant liquid to be withdrawn and either discharged into the sea
or pumped ashore. Where the supernatant liquid is discharged into the sea, any
suspended solids in the discharged supernatant represent a potentially negative
environmental impact.

[0013] United States Patent No. 3,606,036 is an example of the use of a
slurry to directly load mineral materials into an ocean-going bulk carrier. In this
regard, the document describes pumping material into a ship which is then sailed
to a selected port, at which it is unloaded using specialised equipment. In
practice, the loading technique described in US '036 can only be used for very
specific materials. In particular, only materials with free-draining properties (such
as ocean or river-washed sands from which fine particles have been removed to
allow free settling and adequate density) are suitable. The technique can not be
practically applied to the vast majority of minerals extracted as a result of mining
activity (such as the normal products from iron ore, base metals, industrial
minerals or coal operations).

[0014] To the inventor's knowledge, the technique described in US '036
technique has been employed in only a single commercial application on iron
sands at Taharoa in New Zealand. This small-tonnage operation (nominally
850ktpa) employs a single purpose-built ship that sails to China. In June 2007, the
limited capability of the technique was demonstrated when the ship Taharoa
Express listed dangerously as the cargo moved and nearly capsized. The Taharoa
event illustrates the deficiencies of the technique described in US '036 even when
applied to its limited range of applications; namely materials such as mineral
sands that are capable of significant settling under gravity so as to yield a stable
mass in the hull of the vessel. As known to those skilled in the art, a stable mass is
required for safe transit in ocean-going vessels.

[0015] Additionally, the technique is only cost effective at small scales, due
to the requirement for special-purpose ocean going bulk carriers. The technique
also requires each possible market port to be equipped with specialised unloading facilities.

[0016] Jetty systems allow the direct loading of the bulk mineral commodity into an ocean-going bulk carrier that is located in deep water. To serve this purpose, the jetty is typically of a significant length and extends from the shoreline out to the deep water berth. This is an increasingly common means of loading bulk materials onto ocean-going bulk carriers. Some dredging at the berth pocket usually occurs with this option and invariably further dredging is required to allow access from deep water to the berth pockets, therein reducing the length of the jetty. The bulk mineral commodity is typically transported along the jetty by means of conveyors. Although such jetties and operations are relatively common, they have high capital and maintenance costs. In addition, the jetties and associated shoreline facilities are visually unattractive and can cause interference with other near-shore activities since there generally is a significant exclusion zone surrounding the jetty and berthing area.

[0017] With each of the above practices, conveyor systems combined with various forms of stackers and reclaimers are the most common method of dry bulk mineral commodity physical transport from point-to-point. Where required, grabs are used for the loading and unloading of barges and intermediate transport vessels.

Summary of the invention

[0018] According to a first aspect of the present invention there is provided an installation for facilitating the loading of minerals into a marine vessel, the installation comprising:

an onshore slurrying facility for fluidising the minerals into a slurry;

an offshore separation facility for removing at least some of the fluid from the slurry;

a pipeline fluidly connecting the slurrying facility to the separation facility; and

a pump for conveying the slurry from the slurrying facility to the separation facility along the pipeline,
wherein the minerals are available for offshore loading from the installation onto the vessel.

[0019] The offshore component of the present invention is akin to a floating port development. The invention finds particular application in facilitating the loading of bulk mineral commodities into a conventional ocean-going bulk carrier (whether it is handymax, panamax, capsize, China class or other class or size of vessels).

[0020] At least in preferred embodiments, the installation according to the present invention represents an alternative technique for loading ground bulk mineral commodities onto ocean-going vessels (both low and high capacity) that can significantly reduce overall infrastructure capital and operating costs whilst significantly enhancing the shoreline environment and lowering overall environmental impact.

[0021] Preferably, the onshore slurrying facility is located away from the immediate shoreline and in an area that has reduced impact on high-demand shoreline environments.

[0022] Optimally, the minerals are fluidised with water, although other suitable transport fluids may be employed.

[0023] Typically, the offshore separation facility is located in deep water of sufficient depth that ocean-going bulk carriers can be moored (typically >18m).

[0024] Typically, the separation facility includes a store for storage of slurry and/or de-fluidised minerals.

[0025] According to preferred embodiments, the pipeline is buried below the surface for at least part of its length. This is to minimise deleterious visual and environmental impacts. It is particularly advantageous to locate the length of the pipeline from the shoreline to beyond the low tide watermark below the surface. Although, locating the length of the pipeline from the slurrying facility to the shoreline below surface can also be advantageous.

[0026] From the seaward point to the separation facility, the pipeline is usually laid on the sea floor.
[0027] Advantageously, the separation facility includes filtration means for removing at least some of the fluid from the slurry. Mechanical filtration means and especially vacuum filtration, are particularly preferred. Pressure filtration means may also be deployed. A solid-liquid filtration circuit is one particularly preferred form of filtration means. Compared to gravity separation, filtration means enable: the production of a lower-moisture-content product which is markedly safer to transport; application of the technique of the invention to a significantly broader range of minerals; and increased rates of loading.

[0028] Optimally, the filtration means reduces sufficient fluid from the slurry such that the filtered minerals are at or below transportable moisture limit (TML). Filtration to TML or below ensures that the minerals can be transported safely in the ocean going vessel. Such filtration ensures that the bulk material commodity remains structurally stable when loaded into the ocean going bulk carrier's hull and thus avoids the occurrence of liquefaction. When liquefaction does occur, storage stability is lost and the loaded vessel safety is at risk.

[0029] Preferably, the installation includes means for applying post treatment processes to the filtered product. Suitable treatments in this regard include washing to remove deleterious contaminants (for example chlorides present in iron-ore products extracted from saline water systems or acid washing to remove carbonate contaminants), surface enhancement or value addition stages (such as further processing or drying stages) and determined by the nature of the specific bulk mineral commodity.

[0030] The filtration means may discharge de-fluidised minerals directly into the store, or into an adjacent separation facility, an intermediate offloading vessel, or ocean-going bulk carrier.

[0031] Additionally, make-up water supply systems can be accommodated within the separation facility.

[0032] Optimally, the separation facility includes means for returning removed fluid onshore. Returned fluid may be suitably pumped along the pipeline or another pipeline to the onshore slurrying facility or mine site for use in a later fluidising operation. Recycling of process water in this way is particularly beneficial in dry continents such as Australia.
[0033] Preferably, the separation facility includes processing means for processing the minerals subsequent to the removal of the slurry. The processing means typically include means for modifying or enhancing the quality of the minerals or for removing impurities. In this regard, processes such as filter cake washing or leaching can be performed on the minerals.

[0034] Optimally, the loading facilities for ocean going bulk carriers that are included with the facility include associated storage and bulk material recovery functionality. The incorporation of appropriate storage and recovery allows for optimisation of throughput and efficient operation in view of the loading practices of ocean going bulk carriers.

[0035] Optimally, the separation facility is floating and attached to a suitable mooring such as a buoy. Single point mooring systems are particularly preferred, at either the bow or stern of the separation facility. Such a mooring configuration allows loading of ocean-going bulk-carrier vessels or other vessels, from either side of the separation facility. This configuration provides significant improvements in overall offloading rates and an associated reduction in delays in loading of later-arriving vessels. Alternatively fixed mooring may be employed. Whilst not allowing loading from both side of the facility, it reduced the footprint and allows multiple facilities to be integrated into a smaller footprint.

[0036] Optimally, the separation facility includes a mooring means adapted to facilitate the secure moorage of vessels and connection of the pipeline(s) from onshore facilities to the separation facility.

[0037] According to some embodiments, more than one separation facility can be moored together to meet the overall requirements of a given facility. Additionally in some embodiments, one or more supplemental storage and offloading vessels can be securely moored to the separation facility if required.

[0038] According to a second aspect of a present invention there is provided a method of delivering minerals to a marine vessel for loading, the method comprising the steps of:

  fluidising the minerals at an on-shore location into a slurry;

  transporting the slurry to an offshore facility along a pipeline fluidly connecting the on-shore location to the offshore facility; and
removing at least some of the fluid from the slurry to yield the minerals,
wherein the minerals are available for offshore loading from the offshore facility onto the marine vessel.

[0039] Preferably, the method includes the further step of returning removed fluid to onshore along the pipeline.

[0040] Typically, the marine vessel is an ocean-going bulk carrier.

[0041] Preferably, the fluid is removing from the slurry by filtering. Such filtering is optimally performed by vacuum filtration or pressure filtration.

Brief description of the drawing

[0042] A preferred embodiment of the invention will now be further explained and illustrated by reference to the accompanying drawing which is a schematic illustration of the components and process steps conducted at an installation according to the invention.

Detailed description of the drawing

[0043] Turning to Figure 1, an installation 10 for facilitating the loading of minerals into an ocean going bulk carrier 80 is illustrated. Installation 10 includes an onshore slurrying facility 20, a floating separation, storage and offloading facility 40 and an interposed pipeline 60 fluidly connecting slurrying facility 20 with floating separation facility 40.

[0044] Slurrying facility 20 is situated away from the immediate shoreline. The mineral product that is to be loaded onto ocean-going bulk carrier 80 is supplied in a dry or low-moisture form to slurrying facility 20 by way of road and/or rail transport 22. At step 24 the product is unloaded and stored at a stockyard 26 in preparation for slurrying at a slurry manufacture facility 28.

[0045] An alternative approach involves locating stockyard 26 and slurry manufacture facility 28 at a remote mine site 21. In this case, slurried product is delivered to a slurry store 30 located at slurrying facility 20 by way of a pipeline 23 and pump(s) (not shown) or the slurried product is piped directly to floating separation facility 40.
[0046] Product is conveyed from stockyard 26 by a conveyor to slurry manufacture facility 28. Slurry manufacture facility 28 includes a scrubber screen (not shown) for removing any undesirable matter from the product prior to slurring. Slurring is effected by mixing product with water (or an alternative transport fluid) along with a thickener if required. Slurry storage, in the form of surge tanks 30 are installed, as required, for intermediate storage ahead of pumping and for handling any overflow of slurry produced during the slurring operation. Surge tanks 30 are connected to slurry manufacture facility 28 by way of an internal pipeline 31.

[0047] Slurried product is thereafter pumped to floating separation facility 40. Pumping of slurried product is conducted at slurry pump(s) 32. Slurry pump(s) 32 is constructed with sufficient power to account for the dimensions of pipeline 60 and the physical characteristics and volume of the slurried product that is to be pumped.

[0048] Pipeline 60 exits slurring facility 20 and is buried below ground in the region up to the shoreline, so as to minimise any deleterious visual and other impacts on the surrounding environment. From the shoreline, pipeline 60 continues to be buried below ground up to a location beyond the low tide watermark. Pipeline 60 surfaces at this location and continues along the sea floor up to its point of connection with floating separation facility 40.

[0049] Floating separation facility 40 is located in deep water (i.e. greater than 18m) so that ocean-going bulk carrier 80 can be moored. Transported product can be discharged directly into a moored ocean-going bulk carrier 80 in this instance. However, limited dredging of the sea bed around floating separation facility 40 may be required if the water is not sufficiently deep under all required operating conditions. The exact location of floating separation facility 40 is determined, to a large extent, by factors such as water depth, prevailing tides and winds, proximity to the shoreline and regional environmental considerations.

[0050] The direct-discharge, non-dredging option is preferred, as it reduces the volume of required materials handing and consequently the extent of infrastructure capital, operating costs and adverse environmental impact.

[0051] In very large bays with relatively shallow water depth, floating separation facility 40 is required to be positioned a significant distance from the shoreline. As discussed below, intermediate trans-shipment vessels are deployed
to deliver transported product from floating separation facility 40 to ocean-going bulk carrier 80.

[0052] Floating separation facility 40 utilises a single-point-mooring at either its bow or stern to moor facility 40 to a buoy (not shown). In these circumstances, ocean-going bulk carrier(s) 80 can be moored to either side of floating separation facility 40. Encapsulating all of the infrastructure required for separation, storage and offloading of transported product into a single facility that allows loading from either side provides significant improvements in overall offloading rates. This performance enhancement results from a reduction in delays in loading of subsequent vessels.

[0053] Pipeline 60 opens into a slurry receiving chamber 42, from where it is pumped through an internal pipeline network 43 to a solid/liquid separation facility 44. Solid/liquid separation facility 44 includes a single or multiple vacuum filtration system(s) for extracting the particulate minerals from the slurry and separating the water therefrom. Other types of mechanical or non-mechanical filtration systems (such as pressure filtration) can be deployed to extract the solid mineral materials from the slurry. As opposed to gravity separation, mechanical or pressure filtration facilitates the production of a low-moisture-content product that may be safely transported and allows high rates of loading. Mechanical and pressure filtration also allows a broader range of mineral or other products to be efficiently slurried and extracted than is practicable with gravity separation.

[0054] Rather than discharging the supernatant liquid (with any suspended solids) resulting from the slurry filtration operation to the surrounding seas, the liquid is delivered into (a separate) pipeline 47 that terminates either at slurry manufacture facility 28 or remote mine site 21. Returned liquid can be used at either site in a slurrying operation. In this way, instead of acting as a contaminant of the local environment, liquid is beneficially recycled throughout the mineral transportation network.

[0055] Extracted solid minerals are discharged from solid/liquid separation facility 44 into an internal conveyer or chute 45 where they are discharged to a storage area 46 to await the arrival of the next appropriate ocean-going bulk carrier 80. Storage area 46 includes multiple holds to allow for the storage of multiple products.
The solid minerals are offloaded to ocean-going bulk carrier 80 by a shiploader (travelling stacker) 48.

As discussed above, some applications may not allow for the floating separation facility 40 to be established in water that is of sufficient depth for an ocean-going bulk carrier to enter. In this scenario, extracted solid minerals exiting from solid/liquid separation facility 44 are loaded onto one or more intermediate trans-shipment vessels. Such vessels can be safely moored to floating separation facility 40. The minerals are then delivered by the intermediate trans-shipment vessels to ocean going bulk carrier 80 for loading thereon.

Although the primary function of floating separation facility 40 is a means of transferring bulk material from shore to ship, the design of the facility includes means for value-adding to the slurry and/or minerals by further chemical and/or physical processing. While such installations do involve increased complexity and capital and operating costs, these can be offset to some extent by locating the facility in a more capital efficient location.

In broad terms, the approach of the present invention involves 'storage and offloading' functionality in which product is pumped onto a vessel, filtered to below TML, and then directly offloaded onto a conventional international bulk carrier (panamax, capesize, china class, etc) or if there is no bulk carrier present, stored on the vessel until a conventional international bulk carrier presents to offload the filtered product. Modelling of the system suggests that a single floating production storage and offloading facility can operate with a throughput of up to 30Mtpa of product. This is an order of magnitude enhancement to existing systems.

Overall, the technical and environmental benefits of the present invention include the following:

- Increased opportunities for port facilities in areas where natural harbours do not exist and/or in locations where additional port/loading capacities are not available and/or where significant shoreline real estate and access is limited.
- The ability to transport ground bulk mineral commodities directly from the mine site all the way to the port offloading facility by pipeline, which in many cases is the lowest cost form of such transportation. This can
significantly reduce both capital and operating costs and as well as reducing environmental impacts.

- Reduced capital and operating (maintenance) costs in comparison with jetty/wharf structures configurations.
- Significantly reduced environmental footprint, especially in sensitive coastal areas.
- Significantly reduced visual environmental impact via use of pipelines, particularly buried/submerged pipelines, and the elimination of jetties and wharfs connecting to closely-coupled onshore buffer storage areas.
- Reduction/elimination of traditional port construction wastes such as dredging spoil.
- Reduction/elimination of bulk mineral commodity spillage along the shore-to-ship transfer link, which can be a problem with conventional barge-to-transhipment vessel configurations.
- Significant reductions in capital and operating costs compared to barge-to-transhipment vessel configurations.
- Significant extension in the application of the slurry loading system to a greater range of bulk mineral commodities and product types, speeding loading cycles and rates of loading that can be achieved and enhancement of safety in ocean transit of product vessels when compared to systems employing gravity settling of solids. In addition, the discharge of supernatant liquid and the corresponding environmental impacts are eliminated.
- The introduction of value add processing, either with chemical or physical processing, of the filtered material within the floating separation facility.

[0061] It is to be understood that, throughout the description and claims of the specification, the word "comprise" and variations of the word, such as "comprising" and "comprises", is not intended to exclude other additives, components, integers or steps.

[0062] Modifications and improvements to the invention will be readily apparent to those skilled in the art. Such modifications and improvements are intended to be within the scope of this invention.
Claims:

1. An installation for facilitating the loading of minerals into a marine vessel, the installation comprising:

   an onshore slurrying facility for fluidising the minerals into a slurry;

   an offshore separation facility for removing at least some of the fluid from the slurry;

   a pipeline fluidly connecting the slurrying facility to the separation facility; and

   a pump for conveying the slurry from the slurrying facility to the separation facility along the pipeline,

   wherein the minerals are available for offshore loading from the installation onto the vessel.

2. An installation according to claim 1, further including a store for storage of slurry and/or de-fluidised minerals prior to loading onto the vessel.

3. An installation according to claim 1 or claim 2, wherein the separation facility includes a filter for removing at least some of the fluid from the slurry.

4. An installation according to claim 3, wherein the filter is a vacuum filter, pressure filter, or solid-liquid filtration circuit.

5. An installation according to any one of claims 1 to 4, wherein a sufficient amount of fluid is removed from the slurry at the separation facility such that the de-fluidised minerals are at or below the mineral's transportable moisture limit.

6. An installation according to any one of claims 2 to 5, wherein the filter discharges de-fluidised minerals directly into the store.

7. An installation according to any one or claims 2 to 5, wherein the filter discharges de-fluidised minerals into any one or more of: an adjacent
installation, an intermediate offloading vessel and an ocean-going bulk carrier.

8. An installation according to any one of claims 1 to 7, wherein the separation facility includes a make-up water supply system.

9. An installation according to claim 8, wherein the separation facility includes machinery for returning removed fluid onshore.

10. An installation according to claim 9, wherein the machinery is a pump for pumping removed fluid either along the pipeline or along another pipeline to the onshore location.

11. An installation according to any one of claims 1 to 10, further including means for processing the de-fluidised minerals subsequent to the removal of the slurry.

12. An installation according to claim 11, wherein the processing means include means for modifying or enhancing the quality of the minerals, or for removing impurities from the minerals.

13. An installation according to any one of claims 1 to 12, wherein the installation is floating and attached to a suitable mooring.

14. An installation according to claim 13, wherein the mooring is a single point mooring or a fixed mooring.

15. An installation network, comprising two or more installations according to any one of claims 1 to 14.

16. A method of delivering minerals to a marine vessel for loading, the method comprising the steps of:

   fluidising the minerals at an on-shore location into a slurry;

   transporting the slurry to an offshore facility along a pipeline fluidly connecting the on-shore location to the offshore facility; and
removing at least some of the fluid from the slurry to yield the minerals, wherein the minerals are available for offshore loading from the offshore facility onto the marine vessel.

17. A method according to claim 16, further including the step of storing the de-fluidised minerals in a store prior to loading onto the offshore vessel.

18. A method according to claim 17, wherein the removing step is performed by filtration of the slurry.

19. A method according to claim 18, wherein the filtration is vacuum filtration, pressure filtration, or filtration by way of a solid-liquid filtration circuit.

20. A method according to any one of claims 16 to 19, wherein the removing step includes removing a sufficient amount of fluid from the slurry such that the de-fluidised minerals are at or below the mineral's transportable moisture limit.

21. A method according to any one of claims 16 to 20, further including the step of returning removed fluid to an onshore location.

22. A method according to any one of claims 16 to 21, further including the step of processing the de-fluidised minerals prior to loading onto the marine vessel.

23. A method according to claim 22, wherein the processing step includes any one or more of: modifying the quality of the minerals; enhancing the quality of the minerals; and removing impurities from the minerals.
**INTERNATIONAL SEARCH REPORT**

**International application No.**

**PCT/AU2013/001070**

**A. CLASSIFICATION OF SUBJECT MATTER**

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According to International Patent Classification (IPC) or to both national classification and IPC

**B. FIELDS SEARCHED**

Minimum documentation searched (classification system followed by classification symbols)

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Electronic data base consulted during the international search (name of data base and, where practicable, search terms used)


WPI, EPDOC with keywords: fluidise, slurry, sands, coal, granular, loading, convey, pump, pipeline, dewater, sediment and like terms.

**C. DOCUMENTS CONSIDERED TO BE RELEVANT**

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Date of the actual completion of the international search: 2 December 2013

Date of mailing of the international search report: 02 December 2013

**Name and mailing address of the ISA/AU**

AUSTRALIAN PATENT OFFICE
PO BOX 200, WODEN ACT 2606, AUSTRALIA
Email address: pct@ipaustralia.gov.au
Facsimile No.: +61 2 6283 7999

**Authorised officer**

Shuaei Xie
AUSTRALIAN PATENT OFFICE
(ISO 9001 Quality Certified Service)
Telephone No. 0262857942

Form PCT/ISA/210 (fifth sheet) (July 2009)
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This Annex lists known patent family members relating to the patent documents cited in the above-mentioned international search report. The Australian Patent Office is in no way liable for these particulars which are merely given for the purpose of information.

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Due to data integration issues this family listing may not include 10 digit Australian applications filed since May 2001.

Form PCT/ISA/210 (Family Annex)(July 2009)
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