AUSTRALIAN PULP AND PAPER MANUFACTURING INDUSTRY SECTOR

IRC Work Plan 2016-2019

Prepared on behalf of the Pulp and Paper Manufacturing Industry Reference Committee for the Australian Industry Skill Council

THE PULP AND PAPER INDUSTRY REFERENCE COMMITTEE WORK PLAN 2016-2019

Purpose

This workforce development and skills needs analysis represents the latest industry intelligence and resulting work plan of the Pulp and Paper Industry Reference Committee (IRC). It was developed through research of national and industry data sources and ongoing input from IRC members and key stakeholders. The report is designed to advise the Australian Industry and Skills Council (AISC) on the four-year rolling National Schedule of training product development and review work.

The industry intelligence component covers the following topics:

Sector Overview – analysis of the depth and breadth of the industry and identification of the macro environmental forces that currently challenge and / or provide opportunities for the industry

Employment – review of employment projections by the Department of Employment and an outline of the current workforce profile and supply for the industry

Skills Outlook – insights into the key trends that could potentially drive changes in workplace design and identification of key priority skills and skilled labour shortages for the industry.

The training product review work plan – at the end of the report – draws on the industry intelligence, reports and various points of engagement with industry associations, employers and training providers.

CONTENT

A. ADMINISTRATIVE INFORMATION

Name of Applicable Industry Reference Committee (IRC)	Pulp and Paper Manufacturing Industry Reference Committee (IRC)
Name of Applicable Skills Service Organisation (SSO)	Skills Impact Ltd.

EXECUTIVE SUMMARY

This report provides an overview of workforce development and skills needs for the Australian pulp and paper manufacturing industry sector. The report was commissioned to support the Australian Industry and Skills Committee (AISC) in developing the four-year rolling National Schedule of training product development and review work. The report is structured, as per AISC template, in four main sections as follows: sector overview, employment, skills outlook, and training product review plan. Methods of analysis include research of published national and industry data sources and input from Industry Reference Committee (IRC) members and key stakeholders.

The report draws attention to the fact that Australian total paper and paperboard demand has declined by 19 per cent in the last five years, primarily due to the proliferation of digital technology for communication. Despite this challenge, a potential development of bioenergy, carbon offsets, and emerging uses for wood fibre, such as products made of dissolving pulp and Nano cellulosic fibres, could drive new markets and further changes in the pulp and paper products industry. A key growth area for the sector is packaging as more and more products are subject to global trade and environmentally friendly forms of packaging are being sought.

Further, the report reveals that the industry workforce, consistent with many other industry sectors, is reaching the retirement age in high numbers, creating significant challenges for employers – particularly in respect to their ability to attract people to the industry and develop their skills through on the job learning and formal training.

Importantly, employers will increasingly seek high level skills to support more demanding job functions in most workplaces. This occurs because businesses respond to opportunities with:

- ongoing adoption of energy efficiency mechanisms (such as co-generation) and other processes to increase the overall efficiency of the business to meet short term market challenges;
- conversion of processes with declining markets to new opportunities and alternative value products; and
- new collaborative logistics and communication, including inventory control, and tracking and reporting based on digital technology, among many other innovations.

The skills need to support the higher efficiency targets, innovation and automation / digitisation.

Changing job functions for operational employees include process and staff management, quality inspection, generation of information/reporting, process improvements, and technical maintenance. Similarly, higher level skills will be required of specialist managers to support strategic developments and targets. Examples include strategic leadership and change management skills, marketing executive skills, developing investment project skills, global supply chain and logistics skills and other high level skills.

The report also identifies that new energy production and bioengineering skills and occupations are likely to emerge from potential bioenergy and biomaterials production.

Summary of key points in each section

Sector overview

- The pulp and paper manufacturing industry can be described as having six sectors: pulp, paper and paperboard manufacturing; corrugated paperboard and paperboard container manufacturing; paper bag and other paper product manufacturing; paper stationery manufacturing; sanitary paper product manufacturing; and paper product merchandising.

- The industry includes 752 manufacturing businesses who employ 17,000 people; and 1,260 paper product wholesalers.

- In general, the sectors are characterised by a large number of small and medium-size producers with presence in local markets and a smaller number of large businesses which often are multinational companies and operate globally.

- Total sales turnover of the pulp and paper manufacturing sectors decreased by 1.1 per cent (or $104 million) to $9.7 billion between 2012-13 and 2013-14.

- The industry is represented by a small number of peak organisations at the national level, who represent industry associations, employee associations and key industry service bodies.

- Key regulations for the industry include or are related to: the *Environmental Protection and Biodiversity Conservation Act 1999 (EPBC Act)*, *Illegal Logging Prohibition Act 2012*, *Regional Forest Agreement Act 2002*, *Competition and Consumer Act 2010*, and two voluntary forest certification schemes – Australian Forest Certification Scheme (AFCS) and Forest Stewardship Council Scheme (FSC).

- There are no regulated occupations[1], which are specific to the industry sector, except that by an industry requirement, operators who are involved in high risk activities must have licences to perform these work functions.

- Key macro forces which currently challenge and provide opportunities for the industry sectors include:

  - Changes in international markets, which affect the trade of wood fibre and paper products. The key global markets include the United States which is a major importer of paper and paperboard products, Asia and Latin America regions which experience an economic growth, and global producer countries such as South America which underwent a rapid expansion of capacity to produce bleached hardwood kraft.

  - Changes in national exchange rates can have negative effects on the pricing of paper products by domestic producers that import pulp. Tissue manufacturers, for example, are now paying higher prices for imported pulp with no capacity to pass on costs to retailers or consumers.

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[1] Regulated occupations have legal (or industry) requirements or restrictions to perform the work. Regulated occupations require a license from, or registration by, a professional association or occupational licensing authority.

- Increased online shopping is playing a major role in the evolution of the paperboard market segments with a focus on packaging.

- National policies and a potential growing demand for bioenergy and products made of dissolving pulp and Nano cellulosic fibres, which can provide the industry with the potential to develop into a producer for new, niche markets – achieving greater resource utilisation and improved financial results.

Employment

- Employment is anticipated to reduce for all industry sectors in the coming years.

- About 20 per cent of the industry workforce is likely to retire over the next five years.

- A significant number of the workforce occupies roles specific to this industry including paper and wood processing machine operators and printing machine operators. Nevertheless, the sector also involves a range of other jobs that are typical to the manufacturing sector in general.

Skills outlook

A summary of development trends in the pulp and paper manaufacturing industry sectors, which determine new demands for skills, and the proposed training package projects to support these skill needs are provided in the following table.

DRIVER	SKILLS OUTLOOK	TRAINING PACKAGE PROJECT
The need for workforce flexibility to respond to changing operating environment.	There is an identified need for operators to develop skills that support additional job roles. There are also key job roles and specialisations which require vertical integration of operator, technician and troubleshooting skills.	Development of Skills Sets in: • Warehousing Paper Products • Converting Paper Products • Manufacturing Paper Products • Pulping Paper Products
Transition to new processes to increase the overall efficiency of the business to meet the near-term market challenges and risks. This emerges across all sectors.	Skills in leadership, innovation and change management are required at AQF level III, IV and V. Higher skills and knowledge in lean principles are required across the industry sectors to improve processes and efficiency.	Leadership skills for innovation, change management and lean processing at AQF level III, IV and V.
Transition to sustainable supply chains and new collaborative logistics and communication approaches, including inventory control and tracking and reporting based on digital technology. This emerges across all sectors.	Skills in value chain logistics of paper products are required across the industry sectors.	Value chain logistics at AQF level V

Transition to ongoing implementation of new processes and technologies in the pulp, paper and paperboard sector, such as: • modern, environmental pulp / waste paper de-inking and bleaching methods • improved management of the resulting pollutants • improved wastewater treatment methods	New knowledge and operational capacity related to advanced pulp and paper technology and processes is required to fill existing gaps. Skills to operate modern pulp / waste papaer de-inking and bleaching processes are required in the sector.	Review of existing units and qualifications to cover technical skills for emerging / evolving papermaking technologies Waste paper de-inking at AQF level II and III Waste paper bleaching at AQF level II and III
Transition to ongoing implementation of new processes and technologies in the converted paper sector, such as: • equipment upgrade • energy efficiency mechanisms (co-generation) • conversion of processes with declining markets to new opportunities	New knowledge and operational capacity related to advanced converted paper technology and processes is required to fill existing gaps. Skills in leadership, innovation and change management are required at AQF III, IV and V level.	Review of existing units units and qualifications to cover technical skills for emerging/evolving papermaking technologies As above - Leadership skills for innovation, change management and lean processing at AQF level, III, IV and V.
Transition to ongoing implementation of new processes and technologies in the paper product merchandising sector, such as: • new marketing and commercialisation approaches, including digital methods, for driving traditional and recycled paper product demand	Skills in new marketing and communication methods, including digital platforms are required across the sector.	Digital marketing and digital commercialisation at AQF level V.
Estimated growth of the new bioenergy and biomaterials sectors in the future. Examples include integration of biorefineries for the production of bioproducts, solvents, and potentially rayon from ligno-cellulose and of other woodpulp processes.	New bioenergy, biochemistry and biomaterials skills and occupation will emerge. Examples include energy production operators and bioengineering jobs.	Bioenergy, biochemistry and biomaterials qualifications, skills sets and units of competency to support energy production operators and bioengineering jobs.

B. SECTOR OVERVIEW

Sector Description

The pulp and paper manufacturing industry sector integrates the value chain of forests and wood resource utilisation through six industry sub-sectors:

- Pulp, paper and paperboard manufacturing
- Corrugated paperboard and paperboard container manufacturing
- Paper bag and other paper product manufacturing
- Paper stationery manufacturing
- Sanitary paper product manufacturing
- Paper product merchandising

The Training Package (*PPM Pulp and Paper Manufacturing*) currently provides good coverage of full job roles in the pulp, paper and paper manufacturing sub-sector. The other sub-sectors are not fully covered by the Training Package. In 2014, the sector included 752 manufacturing businesses employing 17,000 people and 1,260 paper product wholesalers[2,3].

The sector contribution to the Australian economy through its manufacturing component includes[4]:

- Total sales turnover decreased by 1.1 per cent (or $104 million) to $9.7 billion between 2012-13 and 2013-14.
- Industry value added (IVA) increased by 7.3 per cent (or $199 million) to $2.7 billion over the same period.
- Operating profit before tax (OPBT) increased by 44.1 per cent (or $257 million) to $576 million.
- Employment decreased by 5.9 per cent (or 1,000 people) to 17,000 people at June 2014.

Relevant Training Package Qualifications

The Training Package for the pulp and paper manufacturing sector is *PPM Pulp and Paper Manufacturing Training Package*. PPM comprises 7 Qualifications and 80 units of competency.

PPM QUALIFICATIONS

Qualification Level: Certificate II
Certificate II in Papermaking Operations
Certificate II in Pulping Operations

Qualification Level: Certificate III
Certificate III in Papermaking Operations
Certificate III in Pulping Operations

Qualification Level: Certificate IV
Certificate IV in Papermaking Operations
Certificate IV in Pulping Operations

Qualification Level: Certificate V
Diploma of Pulp and Paper Process Management

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[2] ABS, Counts of Australian Businesses, including entries and exits, June 2010 to June 2014, Cat No 81650
[3] ABS, Australian Industry, 2013-14, Cat No 8155.0.
[4] ABS, Australian Industry, 2013-14, Cat No 8155.0.

Sector Analysis

Sub-sector description and analysis of businesses involved

SUB-SECTOR NAME	PULP, PAPER AND PAPERBOARD MANUFACTURING
SCOPE OF WORK	This sector is comprised of companies that operate mills for the production of pulp, paper and paperboard (in rolls and sheets) from purchased woodchips or from recovered paper and a variety of other inputs such as clay, lime, dyes and chemical resins. Companies manufacture paper and paperboard from their own processed pulp, from purchased pulp or recovered paper There are four main grades of paper and paperboard: • Newsprint • Printing & communication papers • Packaging & industrial papers • Household & sanitary (tissue) Bulk paper and paperboard is supplied to paperboard packaging producers, paper product producers, printing and publishing industries, and overseas production.
PRODUCERS	The sector is dominated by seven major participants, including significant foreign ownership, large scale and multinational operations[5]: • Visy Industries Pty Ltd - Pulp and Paper Division (Pratt Holdings Proprietary Limited) • Paper Australia Pty Ltd (Nippon Paper Group) • Norske Skog Industries Australia Limited (Norske Skog Industries ASA) • Asaleo Care • ABC Tissue • Kimberly-Clark Australia • Orora
GEOGRAPHICAL LOCATION	The sector is concentrated in Victoria and New South Wales. • Paper Australia operates the Maryvale Mill in Victoria, the largest pulp and paper complex in Australia. • Visy's Pulp and Paper Division operates seven paper mills, with three located in Victoria, three in New South Wales and one in Queensland. The primary mill is the Tumut Kraft Mill in New South Wales. • Norske Skog Industries Australia operates the Albury mill in New South Wales) and Boyer mill in Tasmania.
AUTOMATION AND DIGITISATION	The sector features a high level of technological development and computerisation, including a high degree of integration across multiple processes and technologies (production lines) and online systems for efficient control of the supply chain logistics. A high level of capital investment has been undertaken to reduce the environmental impact of the sector over the past decade through solutions involving energy efficiency, water and

[5] Enterprises listed according to their relative market share or significance in the sector

chemical usage efficiency, and use of alternative raw materials. The sector has also invested in biomass power generators to supply energy to their mills.

SUB-SECTOR NAME	CORRUGATED PAPERBOARD AND PAPERBOARD CONTAINER MANUFACTURING
SCOPE OF WORK	In this sector, enterprises manufacture corrugated paperboard and containers from recycled and kraft paper or paperboard or corrugated paperboard. The product includes plain cardboard boxes and specialised packaging for various industrial and consumer goods.
PRODUCERS	The sector is dominated by few major players, profiled by large scale and multinational operations[6]: ▪ Visy Industries Pty Ltd - Packaging Division (Pratt Holdings Proprietary) ▪ Orora Limited ▪ Shute Bay Investments Pty Ltd (former Detmold Holdings Pty Ltd) ▪ Colorpack Limited NSW, VIC ▪ Oji Oceania Management (Aus) Pty Ltd - ▪ Hannapak NSW ▪ Abaris VIC
GEOGRAPHICAL LOCATION	Visy operates major corrugating facilities in Brisbane, Sydney, Melbourne, Wodonga, Adelaide and Perth. Orora produces high-quality recycled packaging paper at the Botany Mill, NSW.
AUTOMATION AND DIGITISATION	Operations are based on production lines supported by computerised machines and processes, including the latest printing techniques, through computer-aided design and computer aided manufacturing software (CAD/CAM)

SUB-SECTOR NAME	PAPER BAG AND OTHER PAPER PRODUCT MANUFACTURING
SCOPE OF WORK	Producers in this sector process paper rolls and sheets into a variety of bags, sack and paper packing goods that are sold to manufacturers of cement, food and other industries such as retail stores, cafes, restaurants.
PRODUCERS	This sector is dominated by three large players and more small size enterprises that produce for niche markets. **Major players in this sector[7]** ▪ Shute Bay Investments Pty Ltd (former Detmold Group) SA, VIC ▪ Orora Limited ▪ Pope Packaging

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[6] Enterprises listed according to their relative market share or significance in the sector
[7] Enterprises listed according to their relative market share or significance in the sector

GEOGRAPHICAL LOCATION	Producers are located in the states with larger population and economic activity - NSW, VIC, QLD, and SA - and in the proximity of capital cities.
AUTOMATION AND DIGITISATION	Technological changes through adoption of new equipment and the computerisation of processes have been implemented in the sector, particularly by the larger businesses with a focus on efficiency of production.

SUB-SECTOR NAME	PAPER STATIONERY MANUFACTURING
SCOPE OF WORK	In this sector, producers manufacture bulk paper into a range of office, educational and personal paper stationery. The products include writing paper, filing paper products, print paper, paper label, paperboard games and toys. These products are sold to both specialist and generalist paper stationery wholesalers and retailers.
PRODUCERS	This sector is dominated by three large players and more small size enterprises that produce for niche markets. **Major players in this sector[8]** ▪ Paper Australia Pty Ltd (Nippon Paper Group) VIC ▪ Labelmakers Group Pty Ltd VIC, WA ▪ Avery Dennison Australia Pty Ltd - Label and Packaging Materials Division (US Avery Dennison Corporation) SA
GEOGRAPHICAL LOCATION	Businesses are located in metropolitan areas, close to other manufacturing industries and retail outlets, in VIC, NSW, SA, WA and QLD.
AUTOMATION AND DIGITISATION	Technological changes through adoption of new equipment and the computerisation of processes have been implemented in the sector, particularly by the larger businesses with a focus on efficiency of production.

SUB-SECTOR NAME	SANITARY PAPER PRODUCT MANUFACTURING
SCOPE OF WORK	This sector includes producers that manufacture sanitary paper products including tissues, nappies, napkins, paper towels, and women's sanitary goods. These products are typically sold to grocery and paper product wholesalers or directly to retailers.
PRODUCERS	The sector is dominated by three large players with multinational operations and a small number of more small size operations that produce for niche markets. **Major players in this sector[9]** ▪ Kimberly-Clark Australia (Kimberly-Clark Corporation) SA, NSW

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[8] Enterprises listed according to their relative market share or significance in the sector
[9] ibid

	- Asaleo Care Limited (publicly-owned) VIC - ABC Tissue Products Pty Ltd NSW, WA - Unicharm Australasia Holding Pty Ltd (Unicharm Corporation, Japan) VIC - Encore Tissue Pty Ltd VIC
GEOGRAPHICAL LOCATION	The majority of sanitary paper establishments are situated in VIC, SA, and NSW
AUTOMATION AND DIGITISATION	Manufacturers and retailers are increasingly reviewing the best ways of providing products, information and services to the customers; are adapting to new ways of collaborative logistics (computerised inventory control systems, tracking and reporting technologies) and digital communication.

SUB-SECTOR NAME	**PAPER PRODUCT MERCHANDISING**
SCOPE OF WORK	This sector operates via two major channels: - Retail and trade merchants selling to the public, DIY market and builders - Wholesalers, manufacturers, importers and exporters Retail and trade merchants stock a broad range of local and imported paper and paperboard. Wholesalers, manufacturers, importers and exporters sell, import and/or export large volumes of bulk paper and paperboard as well as paper-based packaging, stationery and sanitary products that are distributed through the merchant sector or directly to the specialist industries.
PRODUCERS	The sector is highly fragmented comprising of many small-scale paper wholesalers that service narrow geographic or product markets and several large-scale vertically integrated paper companies that hold a dominant position in state or national markets. **Major players in this sector[10]** - BJ Ball - Corporate Express (CE) Australia (US Staples Inc) - Kimberly-Clark Australia (US Kimberly-Clark Corporation) - Paper Australia (Nippon Paper Group) - Avery Dennison Australia Pty Ltd (US Avery Dennison Corporation) - Asaleo Care - Huhtamaki (Huhtamaki Group, Finland) - Spicers - KW Dogget Fine Paper
GEOGRAPHICAL LOCATION	Paper product merchants and wholesalers operate throughout Australia.

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[10] Enterprises listed according to their relative market share or significance in the sector

AUTOMATION AND DIGITISATION	Manufacturers and retailers are increasingly reviewing the best ways of providing products, information and services to the customers; are adapting to new ways of collaborative logistics (computerised inventory control systems, tracking and reporting technologies) and digital communication.

Relevant stakeholders

The pulp and paper manufacturing industry sector is represented at the national level by the following organisations:

INDUSTRY ASSOCIATIONS

Australian Forest Products Association

Australasian Pulp and Paper Industry Technical Association

Packaging Council of Australia

EMPLOYEES ASSOCIATIONS

CFMEU Forestry and Furnishing Products Division

Australian Workers' Union (AWU)

INDUSTRY R&D SERVICES BODIES

Bioresource Processing Research Institute of Australia (BioPRIA)

Forest and Wood Products Australia Ltd

INDUSTRY SERVICES BODIES

ForestWorks

IndustryEdge

Industry and occupational regulations and standards

Industry Regulations

The pulp and paper manufacturing industry in Australia operates under regulations at both the federal and state government levels, which relate to environmental standards and industry's impact on forest resource depletion, water and the level of chemical pollution.

The Federal Government regulates the industry through the *Environmental Protection and Biodiversity Conservation Act 1999 (EPBC Act)*, the centrepiece of federal environmental legislation. Most investment proposals need to meet the EPBC Act requirements. In some cases, specific legislations are required to develop and operate a particular mill (i.e. the Penola Pulp Mill project was approved by the *Penola Pulp Mill Authorisation Act 2007*) or approved with conditions under the EPBC Act (i.e. the Federal Government approval of the Gunns Bell Bay pulp mill in 2007 came with a requirement that Gunns develop an environmental impact management plan).

The state and territory governments regulate the industry through the *Environmental Protection Act 1970* and regulations which differ between states and territories and are monitored by the state EPAs.

Other national legislations that directly or indirectly affect this industry include:

- *Illegal Logging Prohibition Act 2012*
- *Regional Forest Agreement Act 2002*

Industry producers and wholesalers are required to meet general workplace regulations and workplace health and safety regulations.

Wholesalers must also adhere to the *Competition and Consumer Act 2010*, which covers relationships between all parties within the supply chain including wholesalers, manufacturers, retailers and consumers, and promotes fair trading among these parties.

In addition, the industry implements two voluntary forest certification schemes, Australian Forest Certification Scheme (AFCS) and Forest Stewardship Council Scheme (FSC), which typically require forest management practices more stringent than the legislations alone. Both schemes have forest management standards and chain-of-custody standards, of which the latter applies directly to this industry.

Regulated occupations in the industry

Regulated occupations have legal (or industry) requirements or restrictions to perform the work. Regulated occupations require a license from, or registration by, a professional association or occupational licensing authority.

The industry utilises a wide range of regulated occupations including plumbers, electricians, forklift drivers, crane drivers, mobile plant operators (dozers, tractors, bobcats, etc), heavy vehicle operators (medium and heavy rigid), dogmen, riggers, scaffolders, boiler operators, power plant operators and many more. This sectors has a number of activities for which high risk licences are required and operators must have licences to perform those work functions.

Challenges and opportunities in the sector

The Australian pulp and paper manufacturing sector operates in a macro environment shaped by a range of dynamic factors related to wood fibre, markets, trade, technology and environmental challenges. Issues and industry's opportunities for growth relating to these factors are discussed below.

FIBRE SUPPLY

Based on the National Plantation Inventory and domestic consumption of paper products, the nation's wood fibre resources appear to be more than sufficient to supply the fibre needs of the domestic paper manufacturing industry and the market over the next 15 years:

- Hardwood plantation pulplog production is forecast to increase from 4.4 million cubic meters in 2009-10 to about 13.5 million cubic meters per year during 2020-24, peaking at around 13.8 million cubic meters per year during 2030-34[11].

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[11] ABARES, 2013, Australia's' State of the Forests Report

- Softwood pulplog production is forecast to increase from 4.6 million cubic meters in 2009-10 to about 5.6 million cubic meters per year during 2015-19, remaining at this level until the end of 2054[12].

Secondary fibre including residues from veneer production and recovered paper and paperboard contributes also to the wood fibre supply available to the industry and provides opportunities for export as well. Australia is one of a small number of nations already at the forefront of paper recovery and utilisation. Recovered paper is now a valuable resource in its own right and is the sole fibre source for many paper products. This is especially the case in packaging, but is increasingly important for printing and communication papers. Australia also exports recovered paper to the rapid growth of the pulp and paper industry in Asia. Growing export volumes creates a market tension between domestic use and export.

Availability of forest resources is an important factor for the industry's future growth yet there are several other factors which determine whether available logs are harvested and how they are processed (see below).

MARKET AND TRADE COMPONENTS

Demand and trade of paper products

Generally, the supply of paper and paper products is driven by availability of pulp, costs of production, and market drivers.

For instance, the market, particularly for packaging and industrial paper and printing and writing paper, is positively or negatively influenced by changes in the manufacturing sector, digital technology for communication, and conceptually by Australia's overall economy (GDP). Similarly, the demand for newsprint and household and sanitary paper products fluctuates with consumer buying patterns.

The trade of wood fibre and paper products is also affected by changes in international markets, such as in the United States which is a major importer of paper and paperboard products and Asia and Latin American regions which experience an economic growth, or global producer countries such as South America which underwent a rapid expansion of bleached hardwood kraft capacity.

DEMAND	Australian total paper and paperboard demand has declined by 19 per cent (from 3.9 million tonnes to 3.1 million tonnes) in the last five years[13]. In parallel, Australia GDP has increased by an average of close to 2.9 per cent per annum over the last decade. These trends indicate that demand for paper products is lagging considerably behind the growth in the domestic economy.
	Despite the past trends, ABARES projects that paper and paperboard demand will increase by 4.10 per cent in 2049-50 if the value added by manufacturing increases by 5 per cent[14].
IMPORTS	Australian imports of paper and paperboard fell by 4 per cent (or 76,500 tonnes) from 2013-14, to 1.6 million tonnes in 2014-15; and by 11 per cent from 2007-08. The market dominated by imports is printing and communication paper grades.[15]

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[12] ABARES, 2013, Australia's' State of the Forests Report
[13] IndustryEdge, Forest&Wood Strategic Review 2015
[14] ABARES, 2013, Preliminary long-term forecasts of wood product demand in Australia
[15] ABARES, 2015, Australian forest and wood products statistics: March and June quarters 2015

EXPORTS	The export of paper and paperboard fell by 3 per cent (or 3,900 tonnes) from 2013-14, to 1.1 million tonnes in 2014-15; and increased by 48 per cent from 2007-08. Paper grades with the highest export volumes are printing and communication papers and packaging and industrial papers.[16] Fast global population growth and increasing living standards in Asia, South America and Africa are supporting the growing demand for paper products globally, and industry's opportunities to export.

Prices

Pricing of paper products is influenced by national currency, changes in production costs, and resource or product oversupply. Price changes such as price deflation can be a major threat for commercial activity of local producers, influencing the opportunities for growth.

For several years the sector was confronted with the appreciation of the Australian dollar, which made imported stocks cheaper in the local market. The dollar has recovered since 2014, as has, although slightly, the price for paper stationery products and corrugated paper and paperboard containers. The pricing of sanitary paper products and bulk pulp, paper and paperboard has continued to drop well below the 2012 levels.[17]

Further, the change in Australian dollar value has created negative effects on the domestic producers that import pulp. Tissue manufacturers, for example, are now paying higher prices for imported pulp with no capacity to pass on costs to retailers or consumers.[18]

DIGITAL TECHNOLOGIES AND MARKET SHIFTS

Digital technologies have wide-reaching ramifications for the pulp and paper product manufacturing industry.

People are changing the ways in which they correspond, read media and books, and pay bills, with profound effects on the industry. The market shift from paper to digital consumption had led to significant falls in the trade of paper in Australia and other regions, particularly in North America and Europe, over the last five years.

Digital and electronic commerce, however, is playing a major role in the evolution of the paperboard segments, benefiting from increased online shopping.

FUTURE MARKETS

Bioenergy, carbon offsets, and emerging uses for wood fibre are markets of the future. With their development, the relative competitiveness of different forest types and land uses could change, driving further changes in the pulp and paper products industry.

Under certain policy conditions and a growing demand for bioenergy and for products made of dissolving pulp and nanocellulosic fibres, the industry has the opportunity to develop into a producer for new, niche markets to achieve greater resource utilisation and improved financial results.

ENVIRONMENTAL

An obvious strategic threat to the pulp and paper industry is the continuing opposition – supposedly on environmental grounds – to the expansion prospects of the domestic manufacture, particularly of the pulp mills.[19]

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[16] ABARES, 2015, Australian forest and wood products statistics: March and June quarters 2015
[17] ibid
[18] IndustryEdge, Fifteen20
[19] IndustryEdge, Fifteen20

Australia has signed free trade agreements with the USA, ASEAN, Korea, China and Japan. There is significant threat in these agreements for paper and paperboard manufacturers (as opposed to importers) as they allow duty-free entry into Australia and eliminate costs of at least 5 per cent. [20]

While there are little concerns regarding the high-cost and relatively inefficient paper industry in the USA, the agreements with China and Korea have serious consequences for paper and paperboard manufacturers in Australia. This is especially so as the Chinese manufacturing base has expanded ahead of domestic demand and the surplus is being tipped at an alarming and often very cheap price, onto the international market.[21]

FUTURE INVESTMENT

Several development projects have been undertaken in the pulp and paper industry in recent years and will continue. As the examples below demonstrate, the investments are primarily value-adding to existing processes, or are in niches where competitive advantages are relatively certain:

- Technology upgrades at Orora's Botany site and Asaleo Care

- The new de-inking pulp plant of Australia Paper at Maryvale

- Re-development of Norske Skog's Boyer mill

- A new co-generation unit and automated guided vehicles in the warehouse at Kimberly Clark Australia

A recent significant investment was announced by ABC Tissue. The company is planning to expand its operations by building a second new tissue machine, renovate, and further integrate its manufacturing base in Australia. This development is expected to be completed in 2017, making ABC Tissue the largest tissue manufacturer in the region.

C.   EMPLOYMENT

Employment Outlook

The Department of Employment projects[22] that the overall employment in the pulp and paper products industry will decline by 8.9 per cent over the next five years to November 2019 (Table 3).

At the industry sector level, negative employment growth is anticipated across all sectors in the coming years. The largest drop in employment (-16.6 per cent) is expected to occur in pulp, paper and paperboard manufacturing. A significant decline (-6.2 per cent) is also expected in the paper and paperboard product manufacturing sectors and all other related producers.

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[20] IndustryEdge, Fifteen20
[21] IndustryEdge, Fifteen20
[22] Department's projections are based on the forecasts and projections set out in the Mid-Year Economic and Fiscal Outlook (MYEFO)

Table 3: Department of Employment Industry Projections – five years to November 2019
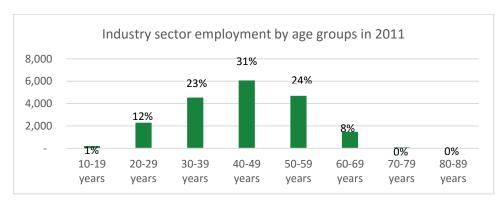
INDUSTRY SECTOR	EMPLOYMENT LEVEL	EMPLOYMENT PROJECTIONS		
	Nov 2014 ('000)	Nov 2019 ('000)	Growth ('000)	(%)
Pulp, Paper and Converted Paper Product (ndf.)	2.3	2.1	-0.2	-8.9
Pulp, Paper and Paperboard	2.6	2.1	-0.4	-16.6
Converted Paper Product	7.9	7.4	-0.5	-6.2
Corrugated Paperboard and Paperboard Container				
Paper Bag				
Paper Stationery				
Sanitary Paper Product				
Total	**12.7**	**11.6**	**-1.1**	**-8.9**

Source: Department of Employment, Industry Employment Projections, 2015 Report. Release date: March 2015. http://lmip.gov.au/default.aspx?LMIP/EmploymentProjections
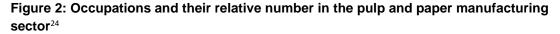
Description of Workforce Supply

The pulp and paper manufacturing industry sector is a significant employer of people in regional and remote areas. While regional, the sector workforce is getting older, confronting the industry with challenges provided by an oncoming wave of retirement. Over 30 per cent of the sector workforce was aged 50 years and over in 2011 (see Figure 1). About 8 per cent of this group is expected to have retired or will retire from the workforce over the next five years together with an additional 20 per cent. The coming workforce retirement is likely to bring with it significant job vacancies across the sector and significant efforts from employers to replenish these skills.

Figure 1: Industry sector employment by age groups in 2011[23]

Specifically, about 80 per cent of current employing occupations in the pulp and paper manufacturing industry sector include professions that are configured in Figure 2 below. It is clear that a significant proportion of the workforce occupies industry-specific roles including paper and wood processing machine operators and printing machine operators. Nevertheless, the sector involves also a range of other jobs that are typical to manufacturing sector in general.

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[23] 2011 Census of Population and Housing

Figure 2: Occupations and their relative number in the pulp and paper manufacturing sector[24]

Occupations in pulp and paper manufacturing

Occupation	Percentage
Paper and Wood Processing Machine Operators	13%
Printing Machine Operators	11%
Stationary Plant Operators	11%
Distribution and Production Managers	9%
Forklift Drivers	7%
Packers	6%
Sales Representatives	5%
Metal Fitters and Machinists	4%
Timber and Wood Process Workers	4%
Storepersons	3%
Machine Operators	3%
Advertising, Public Relations and Sales Managers	3%
Accountants and Bookkeepers	3%
Purchasing and Supply Logistics Officers	3%
Business Administration Managers	2%
General Officers	2%
Transport and Dispatch Officers	1%
Print Finishers and Screen Printers	1%
Graphic Pre-press Trades Workers	1%
Product Quality Controllers	1%
Other Specialist Managers	1%
Toolmakers and Engineering Patternmakers	1%
Other	5%

Most technical skills and the knowledge required in this industry sector are generally learnt after and not before employment commences. The learning occurs 'on the job' through workforce development activities provided by employers. Gaining pulp and paper products qualifications before employment is very rare amongst young people and other potential new entrants.

This means, the workforce supply for industry-specific professions is virtually and consistently nil. In these conditions, the responsibility for engaging and training young people and existing workers with the sector and in specialist training resides solely with employers.

To secure skilled employees or recruit for positions with a general manufacturing character (i.e. including stationary plant operators, forklift drivers or fitter and machinists), the employers need to compete in the labour market, on the available workforce, with other employers and industry sectors.

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[24] ibis

D. SKILLS OUTLOOK

Future changes in workplace and job design are generally driven by innovations - at the business and industry level, introduction of new policies and legislations, and business challenges.

At the business level, innovations may involve introduction of new or improved technologies and processes, new or improved ways to deliver services, and new work organisation including new job demands and job control (i.e. more complex and diversified tasks including greater autonomy). Work organisation involves also a better interaction between internal and external stakeholders through integration of supportive technologies.

Trends in Workplace Design/Job Design[25]

A growing implementation in the industry of leading edge technologies and new approaches to increase efficiency drives further automation and digitisation of some work activities in most workplaces and jobs.

A need to achieve job structures that provide optimum flexibility in terms of production. The work plan includes skill sets for operators and technicians that support additional job role flexibility.

Technology proliferation will require employees to spend much less time on operating machinery or processing paperwork and more time on higher, value added skills and job functions. Examples include management, inspection, generation of information/reporting, process improvements, technical maintenance, customer interaction and communication.

Skills in pulp processing and paper product manufacturing will need to support greater automation and digitisation through higher value-added operational capabilities. Higher level skills which will be required of operational employees include Science Technology Engineering and Mathematics (STEM) skills, compliance skills, and leadership skills. Leadership skills will be essential for team leaders, senior production operators and technicians to introduce new processes and implement innovation, change management and lean manufacturing/production processes.

In addition, higher level supply chain and logistics skills will be required and skills to adapt and respond to climate change challenges, changing government policies, industry code of practices and WHS procedures. Skills at the customer interface will also require significant improvement in relation to customer service, product knowledge, digital marketing and digital commercialisation approaches.

Higher level skills will be required of specialist managers to support strategic developments and targets

There is also a focus on innovation, problem solving and analytical skills for streamlining and implementation of lean principles to enable employees to apply them in their job roles

New bioenergy, biochemistry and biomaterials skills and occupations will emerge. Future production of bioenergy and biomaterials will require new skills and potentially new occupations. Examples include energy production operators and bioengineering jobs.

Key development trends and business challenges likely to change jobs in the pulp and paper sector and sub-sectors include the examples outlined below.

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[25] This section is based on feedback from IRC meetings, desktop research and broader stakeholder consultation via the website

Vertically integrated skils across specialist

Workforce flexibility allows the industry to respond to the changing operating environment. Hence, there is a need for operators to develop a bredth of skills across the full extent of processing operations as well as vertically intergration skills across industry specialisations

Pulp, paper and paperboard

The sector transitions to new processes and technologies including: energy efficiency mechanisms (biomass co-generation plants / bioenergy); modern,environmental pulp / waste paper de-inking and bleaching methods and technologies; improved management of the resulting pollutants; improved wastewater treatment methods; sustainable supply chains; integration of biorefineries for the production of bioproducts, solvents, and potentially rayon from lingo-cellulose and of other woodpulp processes.

Converted paper product

The sector responds with ongoing implementation of equipment upgrade and new energy efficiency mechanisms (biomass co-generation plants / bioenergy); conversion of processes with declining markets to new opportunities and alternative value products; other processes to increase the overall efficiency of the business to meet the near-term market challenges

Paper product merchandising

New marketing and commercialisation approaches, including digital methods, for driving traditional and recycled paper product demand; new collaborative logistics and communication, including inventory control, tracking and reporting based on digital technology

Key priority skills for the sector workforce

The pulp and paper manufacturing industry sector has nominated key priority skill needs for the workforce in leadership, innovation and change management in the context of an international trade exposed industry with large capital outlays at risk of closure due to exchange rates. These skills are required at all levels in the context of driving change in an organisation both drive top down and bottom up. In addition, the skills priory for the industry sector relate to: leadership skills at AQF III, IV and V level to provide lead assistant operator and management with change management and critical thinking skills; knowledge and operational capacity gaps related to pulp and paper technology, from line management through to team leaders; value chain logistics of paper products; and modern pulp de-inking and bleaching methods in an environment of sustainability requirements; lean principles to improve processes and efficiency; and new marketing and communication methods, including digital platforms.

The sector nominated the following generic skills priorities for businesses from a list provided by the Department of Education and Training.

Table 4: Generic skills priorities for the pulp and paper manufacturing industry sector

GENERIC SKILLS	PRIORITY *1-most important; 12 - least important*
Managerial / Leadership – Ability to represent and develop tasks and work processes for desired outcomes	3
Entrepreneurial – Expertise combining both commercial and technical acumen	4
Customer service / Marketing (including digital) – Interact with another person, help them find, choose or buy something; Meet customer wants and needs, via face-to-face or digital technology; Manage online sales/marketing; Manage digital products	12
Financial – Understand and apply core financial literacy concepts and metrics, streamlining processes such as budgeting, forecasting, and reporting, and stepping up compliance; Manage costs and resources and drive efficiency	10
Technology – Deal with increasing mechanisation and automation of handling and computerisation; Work from mobile devices rather than from paper	5
Data analysis – Computational thinking including the ability to translate vast amounts of data into abstract concepts and to understand data based reasoning	9
Communication / Virtual collaboration / Social intelligence – Create value for customers with fewer resources (lean manufacturing) and collaborative skill; Assess, develop and leverage content using new media; Connect to others in deep and direct way	6
LLN – Foundation skills of literacy and numeracy	8
STEM – Sciences, mathematics and scientific literacy	7
Learning agility / Information literacy / Intellectual autonomy and self-management – Identify information need-Locate, evaluate and use information; Filter information for importance; Develop working knowledge of new systems; Work independently	1
Environmental and Sustainability – Ability to focus on problem solving and the development of applied solutions to environmental issues at local, national and international levels	11
Design mindset / Thinking critically / System thinking / Solving problems – Adapt products to shifting consumer trends; Determine significance of what is being expressed via technology; Understand how systems influence one another; Think holistically	2

E.   TRAINING PRODUCT REVIEW PLAN 2016-19

The IRC Training Product Review Plan 2016-19 for the Australian pulp and paper manufacturing industry sector is provided in Appendix A.

Explanation

Time critical issues and interdependencies

Introduction of new technology, globalisaitonal and a need for innovative practice to retain global competitiveness will drive the need for skills in innovation, leadership, change management and lean processing and skills sets to facilitate benchmarking skills in critical areas

Training products scheduled for review more than once in four years

Where qualifications and/or units appear against more than one item, it is because each item relates to separate and different development work.

Training products with contentious or lengthy review

None identified at this stage.

F.   IRC SIGNOFF

This Workplan was agreed as the result of a properly constituted IRC decision.

Signed for and on behalf of the **(Name) IRC** by its appointed Chair

Adele Elice-Invaso
(Name of Chair)

Signature of Chair

Date: 27/09/16.

ATTACHMENT A

IRC Training Product Review Plan 2016-17 – IRC for Pulp and Paper Manufacturing Industry Sector

Contact details: Skills Impact Ltd., 559A Queensberry Street, North Melbourne VIC 3051

Date submitted to Department of Education and Training: 29 September 2016

Planned review start (Year)	TP name	TP code	Qualification name	Qualification code	Unit of competency name	UOC code
2016						
2016	Pulp and Paper Manufacturing	PPM	**Development of Skills set for:** • Warehousing Paper Products • Converting Paper Products • Manufacturing Paper Products • Pulping Paper Products	TBA	**Warehousing Paper Products** Identify and rectify problems in the workplace Measure and calculate routine workplace data Apply quality standards Contribute to team effectiveness Participate in WHS processes Store product **Converting Paper Products** Prepare and dispatch product Converting Paper Products Identify and rectify problems in the workplace Measure and calculate routine workplace data	 PPMPRS210 PPMNUM320 MSS402051A BSBFLM312 PPMWHS210 PPMWAR250 PPMWAR255 PPMPRS210 PPMNUM320 MSS402051A

						Apply quality standards	BSBFLM312
						Contribute to team effectiveness	PPMWHS210
						Participate in WHS processes	PPMFCO210
						Monitor, control and shutdown finishing and converting operations	PPMFCO320
						Prepare and start up finishing a nd converting operations	
						Manufacturing Paper Products	
						Identify and rectify problems in the workplace	PPMPRS210
						Measure and calculate routine workplace data	PPMNUM320
						Apply quality standards	MSS402051A
						Contribute to team effectiveness	BSBFLM312
						Participate in WHS processes	PPMWHS210
						Monitor and control wet end operations	PPMWEO210
						Monitor and control dry end operations	PPMDEO210
						Pulping Paper Products	
						Identify and rectify problems in the workplace	PPMPRS210
						Measure and calculate routine workplace data	PPMNUM320
						Apply quality standards	MSS402051A
						Contribute to team effectiveness	BSBFLM312
						Participate in WHS processes	PPMWHS210
						Monitor and control stock preparation systems	PPMSPR210
						Prepare and start up stock preparation system for production	PPMSPR320
						Pathway units for Cert III level.	
						Troubleshoot and rectify wet end systems	PPMWEO440
						Troubleshoot and rectify dry end systems	PPMDEO440
						Use organisation computers or data systems	MSAPMOPS212A
						Apply basic quality practices	PPMQAS210
						Use sustainable energy practices	MSACMT270A

						Plan a complete activity	MEM14005A
						Follow emergency response procedures	MSAPMOHS110A
						Identify and monitor environmental discharges/emissions	PPMENV210
2016	Pulp and Paper Manufacturing	PPM	**Leadership skills for innovation, change management and lean processing** Certificate IV in Pulping Operations Certificate IV in Papermaking Operations Diploma of Pulp and Paper Process Management	PPM40116 PPM40216 PPM50116	Units of competency for leadership skills to be identified during business case	

2017							
2017	Pulp and Paper Manufacturing	PPM	Certificate II in Pulping Operations Certificate III in Pulping Operations	PPM20116 PPM30116	**Waste paper de-inking** Units of competency for the process of de-inking waste paper to be identified during business case	New units TBA
2017	Pulp and Paper Manufacturing	PPM	Certificate II in Pulping Operations Certificate III in Pulping Operations	PPM20116 PPM30116	**Waste paper bleaching** Units of competency for the process of bleaching waste paper to be identified during business case	New TBA
2017	Pulp and Paper Manufacturing	PPM	**Value chain logistics** Diploma of Pulp and Paper Process Management	PPM50116	**Value chain logistics** To be identified during business case for value chain logistics across supply chains for both sectors	New TBA

2018						
2018	Pulp and Paper Manufacturing	PPM	**Digital marketing and digital commercialisation** Diploma of Pulp and Paper Process Management	PPM50116	**Digital marketing and digital commercialisation** Units of competency for new marketing and communication methods, including digital platforms	New TBA
2018	Pulp and Paper Manufacturing	PPM	**Bioenergy, biochemistry and biomaterials** Qualifications, skills sets and units for bioenergy, biochemistry and biomaterials skills	TBA	**Bioenergy, biochemistry and biomaterials** Qualifications, Skills sets and units of competency to support energy production operators and bioengineering jobs and bioenergy, biochemistry and biomaterials skills	New TBA

4 year rolling unit reviews

2016						
					Review 25% of units:	
					Pulping operations	
					Monitor and control pulping operations	PPMPUL210
					Store and distribute pulped product	PPMPUL250
					Prepare and start up pulping system operations	PPMPUL320
					Co-ordinate and implement pulping plant shutdowns	PPMPUL330
					Troubleshoot and rectify pulping processes	PPMPUL440
					Primary resource operations	
					Prepare and operate the woodchip production system	PPMRES210
					Distribute woodchips	PPMRES250
					Receive materials	PPMRES260
					Unload materials	PPMRES270
					Troubleshoot and rectify primary resource operations	PPMRES340
					Water services	
					Operate water systems	PPMWAS210
					Troubleshoot and rectify water systems	PPMWAS340
					WHS	
					Participate in WHS processes	PPMWHS210
					Contribute to WHS processes	PPMWHS310
					Maintain WHS processes	PPMWHS320
					Identify, assess and control WHS risk in own work	PPMWHS410
					Manage WHS processes	PPMWHS420
					Waste paper operations	
					Monitor and control waste paper operations	PPMWPO210
					Prepare and start up waste paper operations	PPMWPO320

					Co-ordinate and implement waste paper shutdown	PPMWPO330
					Troubleshoot and rectify waste paper operations	PPMWPO440
2017						
					Review 25% of units:	
					Chemical preparation	
					Prepare chemical products	PPMCPR210
					Computer / process control equipment	
					Operate process control equipment	PPMCSK310
					Environmental monitoring	
					Identify and monitor environmental discharges/emissions	PPMENV210
					Monitor and control environmental hazards	PPMENV320
					Electrical power generation	
					Monitor and control power generation system	PPMEPG210
					Manage a power generation system startup	PPMEPG320
					Co-ordinate power generation system shutdown	PPMEPG330
					Troubleshoot and rectify power generation system	PPMEPG440
					Chemical recovery operations	
					Monitor and control chemical recovery operations	PPMREC210
					Prepare and start up chemical recovery operations	PPMREC320
					Co-ordinate and implement chemical recovery shutdowns	PPMREC330
					Troubleshoot and rectify chemical recovery operations	PPMREC440

					Business support	
					Business support	
					Contribute to effective working relationships	PPMREL210
					Stock preparations operations	
					Monitor and control stock preparation systems	PPMSPR210
					Prepare and start up stock preparation system for production	PPMSPR320
					Co-ordinate and implement stock preparation system shutdown	PPMSPR330
					Troubleshoot and rectify stock preparation systems	PPMSPR440
					Apply sustainable work practices/policies	
					Apply sustainable work practices/policies	PPMSUS210
					Develop workplace policy and procedures for sustainability	PPMSUS510
2018						
					Review 25% of units:	
					Coated paper processes	
					Monitor and control coated paper processes	PPMCPP210
					Prepare and start up coated paper processes	PPMCPP320
					Co-ordinate the shutdown of coated paper processes	PPMCPP330
					Troubleshoot and rectify coated paper processes	PPMCPP440
					Dry end operations	
					Monitor and control dry end operations	PPMDEO210
					Prepare and start up dry end operations	PPMDEO320
					Co-ordinate and implement dry end shutdown	PPMDEO330
					Troubleshoot and rectify dry end systems	PPMDEO440
					Finishing and converting	
					Monitor, control and shutdown finishing and converting operations	PPMFCO210

						Prepare and start up finishing and converting operations	PPMFCO320
						Troubleshoot and rectify finishing and converting systems	PPMFCO340
						Numeracy	
						Estimate and calculate basic data	PPMNUM210
						Measure and calculate routine workplace data	PPMNUM320
						Calculate and analyse production and financial performance	PPMNUM430
						Quality	
						Apply basic quality practices	PPMQAS210
						Co-ordinate in-process quality assurance	PPMQAS420
						Oversee quality assurance process	PPMQAS430
						Wet end operations	
						Monitor and control wet end operations	PPMWEO210
						Prepare and start up wet end operations	PPMWEO320
						Co-ordinate and implement wet end shutdown	PPMWEO330
						Troubleshoot and rectify wet end systems	PPMWEO440
2019							
						Review 25% of units:	
						Handling and preparing waste paper for pulp production	
						Store and dispatch waste paper	PPMHWP250
						Receive waste paper	PPMHWP260
						Unload waste paper	PPMHWP270
						Load shifting	
						Operate overhead crane	PPMMHV210
						Planning and organising	
						Plan and undertake a routine task	PPMPLN210
						Plan a complex activity	PPMPLN420

					Preventative maintenance / operator maintainer	
					Undertake operator level preventative maintenance	PPMPRM210
					Perform lubrication	PPMPRM220
					Production support	
					Identify and rectify problems in the workplace	PPMPRS210
					Solve systemic problems in the workplace	PPMPRS320
					Operate ancillary equipment	PPMPRV210
					Co-ordinate and direct clothing changes	PPMPRV320
					Steam generation	
					Monitor and control boiler operation	PPMSTM210
					Manage steam boiler startup	PPMSTM320
					Shut down and bank steam boiler	PPMSTM330
					Troubleshoot and rectify boiler plant systems	PPMSTM440
					Warehousing and dispatch	
					Store product	PPMWAR250
					Prepare and dispatch product	PPMWAR255
					Warehouse product packaging	PPMWAR280