RESOURCE INDUSTRY TRAINING COUNCIL

INDUSTRY DEVELOPMENTS AND WORKFORCE CHALLENGES

MANUFACTURING

PETROLEUM AND COAL PRODUCT | BASIC CHEMICAL AND CHEMICAL PRODUCT | POLYMER PRODUCT AND RUBBER PRODUCT | NON-METALLIC MINERAL PRODUCT | PRIMARY METAL AND METAL PRODUCT[1]

As the ninth-largest employer in Western Australia, over the past 10 years, employment in the manufacturing sector has been volatile.

Manufacturing employment peaked in February 2009, at 105,100 employees with 88.9 per cent in full time employment. The sector's employment trough was experienced in August 2017, when the workforce contracted to 68,900 employees with 82.1 per cent of these being employed on a full time basis[1]. From the recent peak to trough, Western Australia's manufacturing industry has contracted 34.4 per cent. The first half of 2019 has shown some promise with modest employment growth peaking at 94,000, however has since declined a further 28.4 per cent to 73,200 in May 2020 with approximately 84 per cent of the workforce employed full time[1].

Nationally, industry report serious challenges in accessing high-quality Vocational Education and Training (VET) which have led to a substantial reduction in training being undertaken in the industry. At the same time that training effort is decreasing, there has been a shift in the educational profile of new applicants looking to enter the Plastics, Rubber and Cablemaking industry. As a consequence of negative media about the future of the wider manufacturing sector, people seeking work in this segment of the manufacturing industry are increasingly being reported to have lower levels of academic attainment, and consequently to have lower levels of Science, Technology, Engineering and Mathematics (STEM) skills. This shift in the profile of applicants to the industry comes at a time when job roles are changing and there is an increasing need for STEM skills[2]. The current revision of the PMB Plastics, Rubber and Cablemaking training package is intended to support new skills in workers and deliver work-relevant training for industry stakeholders[3] and address the industry skills need.

The process manufacturing industries in Western Australia have an ageing workforce, which highlights the importance of knowledge transfer in the industry and a need to build a talent pipeline through attracting a younger workforce. The demise of North Metropolitan TAFE's PARTEC capability has seen technical training delivery for the plastics and rubber industry largely confined to one enterprise RTO and one private RTO both servicing the Conveyor Belt sector, and South Metropolitan TAFE servicing the Fiberglass Shipbuilding and Composites sectors.

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[1] ABS - 6291.0.55.003 Labour Force, Australia, Detailed, Quarterly, May 2020

[2] PMB Plastics, Rubber and Cablemaking Training Package Skills Forecast and Proposed Schedule of Work 2018-2022

[3] PMB Plastics, Rubber and Cablemaking Training Package Skills Forecast and Proposed Schedule of Work 2019-2023

The Composites manufacturing sector of WA has an annual turnover of approximately $300 million AUD and comprises of approximately 1200 employees spread across greater than 80 organizations. Whilst companies in overseas markets are generally large, top tier organisations, the WA Composites industry is dominated by small to medium enterprises with entrepreneurial origins[4]. Composites manufacturers within WA can be divided in key market segments (outlined in the table below) based on the products they manufacture.

Table 1 – Composites industry in WA manufacturing sectors[4]

Sector	Product	Approximate proportion of WA companies
Pools and spas	Pools and spas (including repairs)	25%
Marine craft	Boats – canoes, dinghies, ferries, power boats, yachts, commercial vessels, super yachts Surfboards, windsurfers, canoes, etc.	34%
Defence	Decking, hatches, and component parts for aircraft, naval ships, and submarines Repairs and maintenance	2%
Transport • Automotive • Public transport • Aviation	RVs, caravans, camper vans, bicycles, and racing cars Trucks and trailers Trains, buses, and trams Panels, wings, engine casings, blades, and helicopters	5%
Industrial • Resources – mining, oil and gas, agriculture • Construction and infrastructure	Drills, pipes, storage tanks, equipment Grilles, walkways, handrails Architectural features – bridges, public art, cladding, etc.	27%

The profitability of Composites manufacturers (termed fabricators within the industry) is ultimately driven by demand for the end products. The market sectors most protected from competition with imported products, produce large items which cannot be disassembled and therefore have high transportation costs[5]. Many of these industrial products are supplied to the resources and agriculture sector (e.g. storage tanks, drilling riser buoyancy modules). Export earnings have also been increased for fibreglass-based products, with the depreciated Australian dollar making these products cheaper in international markets and boosting earnings pre-COVID[5]. The RITC sees potential for growth in the Composites sector to support an expansion in Western Australia's resources sector which will also support a diversification in the State's industry base and create new jobs in Western Australia's manufacturing industry,

[4] Composites Industry of Western Australia, Scoping Study 2020, commissioned by the RITCWA

[5] IBIS WORLD - Fibreglass Product Manufacturing in Australia, Industry Report C1919B, accessed July 2nd 2020

particularly in the context of the Australian Marine Complex development and proposed Advanced Manufacturing Hub in the South-West.

The impact of COVID-19 has been mixed amongst Composites fabricators and the environment remains dynamic. In a recreational context, the effect of economic uncertainty and business rationalisation of household discretionary expenditure, impacted the number of orders placed for recreational products during the March-April period. However, after this initial interruption, a market recovery has been reported, as select individuals re-direct international holiday expenditure to invest greater capital in home comforts and local activities (e.g. pools and spas). Additionally, fabricators of large recreational products have also been protected by the long manufacturing lead time (1.5-2.5 years), fuelling optimism in the organizations capacity to sustain current operational output (and workforce employment) throughout the immediate crisis. In an industrial context, the sustained activity of the resources and agricultural sectors have supported demand, however discretionary expenditure budgets have been reviewed for the oil and gas sector.

The recruitment of skilled Fibreglass technicians and Composites workers has largely shifted to international markets, due to deficiencies in the local talent pool with companies referencing a shallow pool of talent, reluctance to work in an industrial environment and reticence to commit to a job, as primary recruitment challenges[6]. Whilst not ideal, the international recruitment strategy serviced the industry need for a time, until the relevant occupations were removed from the Skilled Migration Program priority occupation list, effectively closing this pathway[6]. Consequently, the Composites fabrication workforce is experiencing a persistent skills shortage, and need to recruit and retain a new pipeline of talent, supported by an innovative training system.

From a rubber conveyor belt perspective, the resources sector requires service companies to have a skilled workforce capable of undertaking necessary conveyor belt repair and maintenance activities safely and productively. In late 2018, employers and contractors from the conveyor belt manufacture and maintenance sector approached the RITC regarding training arrangements in their sector citing concerns of a lack of standardization, limited uptake in existing Traineeships, and limited provision and capability outside of enterprise RTOs. Following receipt of a letter of intent by the Office of the State Training Board, the RITC developed an EVAC submission seeking a variation of the existing Traineeship to create a Conveyor Belt Technician Apprenticeship using the PMB30116 – Certificate III in Polymer Processing qualification. This submission was subsequently endorsed by the State Training Board and Minister for Education and Training in September 2019. Since endorsement, the RITC has been working with the conveyor belt manufacturing and maintenance sector, RTOs, and the Department of Training and Workforce Development around implementation arrangements, with North Metropolitan TAFE making a commitment to deliver the apprenticeship.

The Future Batteries Industry Cooperative Research Centre (FBICRC) presents an opportunity for the WA manufacturing industry to manufacture key components for research and testing[7]. To

[6] Composites Industry of Western Australia, Scoping Study 2020, commissioned by the RITCWA

[7] jtsi.wa.gov.au/news-media/news-detail/2019/04/11/wa-to-host-australia's-future-battery-industries

date, the FBICRC has completed a feasibility study for Cathode precursor production within WA and released a roadmap for the Cathode Precursor Pilot Plant project. Curtin will lead the follow up project to establish a Cathode Precursor pilot plant at CSIROs Waterford facility[8].

From a WA chemical perspective, according to IBISWorld data, whilst 60% of the Basic Inorganic Chemical Manufacturing companies in Australia are located on the eastern seaboard (Victoria and New South Wales), several companies of significant scope and scale operate within Western Australia largely servicing the resources sector[9]. These companies are located in the Kwinana Industrial area and include Wesfarmers, Coogee Chemicals, and Tronox. Within the Pilbara region, Perdaman Industries (Chemical & Fertilisers) has signed a binding Heads of Agreement for the engineering, procurement, and construction (EPC) work for its urea project in Karratha. Perdaman will invest a total of AUS$4.5 billion to develop the plant, securing natural gas for fertiliser production from Woodside[10]. The project (Project Destiny) is estimated to generate approximately 2000 jobs during the three-year construction phase, and 200 permanent plant jobs in Karratha on completion[10]. Western Australia also includes Australia's main sodium chloride operations[9].

Access to long term and competitively priced natural gas supply as a feedstock was identified by Chemistry Australia (formerly the Plastics and Chemicals Industries Association – PACIA) in its strategic roadmap document released in mid-2014[11] and industry concerns of energy pricing[12]. The roadmap identified the importance of a strong innovation ecosystem (linked to a robust research and development capability) and appropriate intellectual property safeguards. Faced with competition from lower wage economies in the region, it is important to create a different and unique value proposition. Chemistry Australia believes innovation is a key competitive advantage which the chemicals and plastics industry and their downstream associated industries, need to have in order to meet the demands of growing markets globally (and domestically).

From a Western Australian standpoint, this is being delivered through the establishment of a WA Chemistry Innovation Hub which is supported by the Western Australian Government as part of its economic diversification agenda. The initiative is led by Curtin University and Chemistry Australia together with CSIRO and industry[13], and aligns with the State's focus on innovation and further development of its science, technology engineering and mathematics (STEM) capability.

From a training delivery perspective, Kwinana Industries Council (KIC) works in partnership with students, schools, industry, registered training organisations and Murdoch University, to

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[8] https://fbicrc.com.au/wp-content/uploads/2020/07/CEO-Newsletter-July-2020-3.pdf

[9] IBIS WORLD – Basic Inorganic Chemical Manufacturing in Australia, Industry Report C1813, accessed July 20th 2020

[10] https://www.worldfertilizer.com/project-news/01072020/perdaman-agrees-epc-terms-for-karratha-urea-project/

[11] PACIA – Adding Value – the critical, enabling role of the chemicals and plastics industry for Australia's future, July 2014

[12] PMA Chemical, Hydrocarbons and Refining Training Package Skills Forecast and Proposed Schedule of Work 2019-2023

[13] PACIA, ibid

promote educational outcomes leading to further education or employment for Western Australian high school students.

The KIC model exposes students to the numerous career opportunities in industry (year 9 and 10). The students have access to different learning programs, external to school, which include resume writing, mock interviews, STEM based activities and excursions to industry and university, giving the students an insight into job roles and the confidence to help them realise their full potential. Graduation from the Year 10 programs gives the students a 'C' point towards their Western Australian Certificate of Education (WACE). KICs Education Partnership draws from 17 high schools, resulting in increased enrolments and completions of certificate II, Metals and Engineering, and Plant Mechanic (Heavy Diesel) qualifications during year 11 and 12. KIC reports 98% of the Certificate II students articulate into the associated apprenticeship.

South Metropolitan TAFE's ACEPT facility located at Munster, south of Fremantle plays a role in servicing the demand for process operators from Kwinana Industrial Area companies. This is provided through a Traineeship pathway at the Certificate III level.

INDUSTRY WORKFORCE PRIORITIES

Nationally, it has been found that workers in the Plastics, Rubber and Cablemaking industry increasingly require computer literacy skills to ensure they are able to work within more automated plants and ensure they can integrate new technology into broader systems. Workers will still require training in 'traditional' plastics, rubber and cablemaking skills. However, these will increasingly need to be balanced with problem-solving and decision-making skills as businesses switch their operations from higher volume manufacturing to smaller runs for niche/new industries. This increasing demand for generic skills to complement and support industry-specific technical skills and knowledge is common across other parts of the manufacturing sector.[14]

The industry workforce priority for the conveyor belt sector remains to support the implementation process for the apprenticeship and associated Trade Skills Recognition pathways. There is an additional industry appetite to establish pre-apprenticeship pathways into the apprenticeship program once implementation is complete.

Whilst support for national accredited training remains strong within the WA Composites sector, support for the apprenticeship (Certificate III in Engineering - Composites Trade) has largely evaporated, with 15 apprentices commencing since 2013, of which 4 have completed and 1 is currently enrolled[13]. Nationally accredited composites training is currently serviced by a sole provider in WA, with industry citing concerns the citing the formal VET training system is "too slow, too rigid and too removed", and the qualification does not teach the full range of occupational skills required[15]. Consequently, the industry has largely transitioned to an

[14] PMB Plastics, Rubber and Cablemaking Training Package Skills Forecast and Proposed Schedule of Work 2018-2022 page 18

[15] Composites Industry of Western Australia, Scoping Study 2020, commissioned by the RITCWA

unaccredited, ‘in-house’ training model (except for license and permit requirements) and disengaged from the national training system[13].

To further support competency-based wage progression and define career pathways within the sector, a need to re-engage in nationally accredited training is apparent. Recommendations to achieve this include, increasing the flexibility of the VET sector including offering on-site training solutions, and creating a training pathway from micro credential or skill sets through to full qualifications[16]. Priority action therein includes unpacking the relevant training packages (MEM and PMB) and identifying skill set or micro-credential opportunities, aligning skills and/or qualifications with occupations within career pathways, and reviewing the existing apprenticeship and traineeship for their occupational relevance and identifying learning gaps.

From a recruitment perspective, the Composites sector sits at the forefront of new technology, deploying exciting and innovative products to market segments such as defence, aviation, space exploration, and recreational activities. However, the sector and by broader extension materials science itself, remains largely invisible in the eyes of new or returning labour market entrants. Whilst a degree of this invisibility is a function of intellectual property agreements and privacy clauses therein, there is a need to re-introduce and re-vitalise the image of the sector in the eyes of the general public for broader appeal. The population of careers-related information with sector content, building positive relationships with schools and career agencies, and increasing participation in accredited training, are priority strategies to support this goal.

[16] Composites Industry of Western Australia, Scoping Study 2020, commissioned by the RITCWA