



Industrial Maintenance Roundtable NSW
Common Interest Workgroup (CIWG) Report
from Meeting on 30th October 2007

Best Practice and Innovative Approaches for Contractor Management CIWG



This document is compiled from discussions during the NSW IMRt Common Interest Workgroup (CIWG) on Best Practice and Innovative Approaches for Contractor Management. Document Compiled by Peter Todd and Howard Witt - [NSW IMRt Facilitator](#)

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Best Practice and Innovative Approaches for Contractor Management

Attendance List

Attendee	Organisation
John Roncken	Alcoa Yennora
John Murphy	Alcoa Yennora
Gus Ferguson	Alcoa Yennora
Warren Steele	ANSTO
Mark Winnell	ANSTO
Derek Sheppard	BlueScope Steel
Corey Bessi	BlueScope Steel
Sharon Brown	BlueScope Steel
Peter McManus	BOC
Howard Witt	Ex ANSTO
Eddy Valentinis	Hunter Water
Rowan Lonergan	Hunter Water
Terry Appleby	OneSteel/ WorleyParsons
Greg Clifford	OneSteel
Jillian Searant	Orica
Keith Platt	Orica
Peter Todd	SIRF Roundtables
Wayne Spencer	Sydney Water
Samuel Lin	Sydney Water

Introduction

The NSW Industrial Maintenance Roundtable (IMRt) held a Common Interest Work Group (CIWG) meeting on Best Practice and Innovative Approaches for Contractor Management focusing on how best to manage contractors in an industrial plant environment. This meeting was held on the 30th October 2007 at the Pennant Hills Bowling club. The meeting was attended by 19 people from 9 different organisations. The information and ideas included in the document came directly from the discussions that took place at the meeting.

Topics discussed at the meeting included Maintenance Shutdowns, Planning, Standardisation, Skills Shortages, Cost Structures, Smaller Projects, Administration, Innovation in Contractor Remuneration, Training, RCA's and Retention of Knowledge. The NSW IMRt held one other CIWG meeting related to contractors on the 27th September 2007 and the topic was Safety Management for Contractor.

The IMRt is a maintenance networking organisation coordinated by SIRF Roundtables (SIRF Rt) www.sirfrt.com.au. This report gives feedback to meeting attendees and other interested parties. The meeting included the development of a comparison matrix, which is shown on the following page. This matrix was filled out by attendee organisations to enable comparisons to be made between organisations on the issues discussed.

Contractor Management Comparison Matrix

Contractor Management	Hunter Water	ANSTO	Sydney Water	BlueScope Steel	Alcoa Yennora	OneSteel	BOC	Orica
How are large and Capital contracts Managed?	Responsibility of Contract manager. Generally the construction site is under control of the principle contractor for duration of project but some HWC safety standards are imposed. ☺	Large Capital Works is fixed price Lump Sum Internally project managed Externally designed and implemented ☺	D & C (Design & Construct)	In-house Capital approval process Lump Sum ☺	Consulting Engineers Request for Assets (RFA) ☺	Alliance Managed ☺	Internal Project Mgt plus Process Design ☺	Orica process manager + supervisor Orica Scope and Tender ☺
How are maintenance contracts managed? What is the % that are lump sum, schedule of rates, Costs Plus, etc.	Quoted Jobs (fixed price) Schedule of labour rates Contracts manager ☺	Schedule of rates + markup on materials Fixed price per unit on fixed time servicing ☺	Maintenance SOR (Schedule of Rates) Managed via KPI's Also use an in-house service provider	Outsourced Management -Predominantly cost reimbursable 50% -Schedule of rates 50% - Minor bid unit & some lump sum ☺	Schedule of Rates using Alliance Contractors and some fixed price scoped work ☺	Schedule of Rates ☺	Both lump sum plus Schedule of Rates Depending on Scope/ Risk of work ☺	Alliance Partner (MDINT) Schedule of Rates, Cost plus payments SAP (M-TEC) - Wages ☺
How are FM (Facilities Maint.) and smaller contracts managed?	-In-house trades personnel oversee the work, or depending on site they may be managed by site personnel (operators) -Weekly reports to contract managers -Via work order schedule maintenance ☺	As above ☺	For Maintenance * Head contract across all sites Minor Capital Works * Via annual renewal program 'relationship contract' with head contractor	Outsourced Management 20% cost reimbursable 80% SOR (contracted) ☺	Fixed prices except for consumables Building Contractor. Schedule of rates ☺	In-house and Quoted Work ☺	FM done as part o plant maintenance program. Facilities not a large component of total work ☺	Alliance Partner (FTS) Schedule of Rates, Cost plus payments SAP (M-TEC) - Wages ☺
How do you manage the safety and induction issues for contractors?	Site specific inductions managed by operators at site OHS Monthly reports Periodic group inductions ☺	Inductions - General and Specific High level of supervision Review of SWMS/ USA's Safe Work Permits ☺	Overall Induction * Delivered by head contractor Site Specific * Delivered by SWC operations staff	Internal BlueScope safety management system. BSL auditing Contractor responsibility Training records in BSL System ☺	AS best we can Formal induction process Standard procedures/ WP's discrete training ☺	In-house standardised ☺	Web based inductions Interactive PC based inductions Central register/ database JSA's PTW MOC (mgt of change process) ☺	Clearance systems - JSERA Auditing Site Inspections/ UAP Incident Reporting Site & Plant Inductions ☺
What is your structure for management of contractors and setting levels of supervision and auditing?	Panel of regular contractors on period contracts Random supervision Weekly work in progress reports ☺	Trade bases supervision, planning, prioritising through a Work Order system	* Management of subcontractors by single head contractor Auditing by SWC contract Managers Level of supervision is an issue (varies)!	KPI driven and linked to contracts (Where in existence) Agreed supervision levels (quality and issue) ☺	Alcoas & Contractors do safety audits & observations Equipment Managers assess workmanship quality and productivity ☺	Contractor Controlled (Accredited) ☺	Auditing - Site based on the job. Routine centrally driven ☺ Supervision - Mostly AD Hoc. No defined process ☺	Project Manager (Orica) Orica Supervisor Contractor Supervisor Clearance Auditing ☺
What are the issues with contracts administration and paperwork? How does your system work?	Register of inductions Supervision of contractors on remote sites Invoice cost as to quoted prices ☺	Admin is high maintenance P/O invoicing - W/O close outs Setting up Contracts/ Tendering is high maintenance ☺	Maintenance Database (Maximo) for raising/tracking of work orders. Decentralised system fro closing orders.	Due to outsourcing - time delay - Mgmt control issues - Disconnect between vendor & BSL System OK. Compliance Poor ☺	Auto payment system Tied in with Work Orders Contractors have problems returning completed paperwork ☺	SAP Controlled ☺	Large contracts are centrally managed Small contracts are managed locally Needs closer mgt with Safety ☺	SAP Controlled Work Order/ Clearance Cold Work/ JSERA Hot Work Excavation/ Bid Permit Working at Heights EVE ☺
What are your KPI's for managing contractors, setting targets, incentive payments etc.? What Works?	WIP reports Safety Response times Continued return work is incentive ☺	Not done ☺	Incentive payment/ Penalty	Profit at risk Minimum hurdles- Safety/environment Self funding incentives Work mgt measures powerful but difficult to balance against business benefit ☺	Safety Response Time Completion rates Availability (Competitive labour suppliers) ☺	KPI on Alliance and permanent contracts ☺ Not on Labour hire ☺	Generally no KPI's unless a large contract. Smaller based on site evaluation only ☺	KPI's - Incentives in Shut Downs No injuries to anyone ever No Environmental Excursions No more than 1 recordable incident ☺

Best Practice and Innovative Approaches for Contractor Management

The attendees to the meeting had a range of roles from a high level responsibility for managing projects and contracts to those who had a direct supervision relationship for the contractor personnel doing the work.

The attendees from **Alcoa** were John Roncken (Maintenance Superintendent), John Murphy (Equipment Manager) and Gus Ferguson (Contract Manager). They were from Alcoa Rolled Products at Yennora, which is only a very small part of Alcoa's total Business. They contract out a lot of work and have had some wins and some losses with contracting over the years. They were interested in improving their win rate. They have a wide range of problems with contractors one of which is that contractors like to get organisation reliant on them and then try to maximise their profit.

The attendees from **OneSteel** were Terry Appleby (Worley Parsons Engineering Alliance Area Projects Manager) based in Newcastle and Greg Clifford (Maintenance/ Contract Supervisor) at the Sydney Steel Mill. OneSteel in spend \$40M pa on contract maintenance and they use alliance partners to help manage this workload. Many contractors used on-site every day. Sydney Steel Mill use contracts mostly on a do and charge basis and the arrangement generally works well. They use between 10 to 50 trades staff per week.

The attendees from **Hunter Water** were Eddy Valentinis (Services Supervisor) and Rowan Lonergan (Contract Manager). Hunter Water use contractors for both maintenance and project work. They use a 'panel of contractors' that have been approved by them. The quality of trades from the panel contractors is generally OK.

The attendees from **Orica** Kooragang Island in Newcastle were Jillian Searant (SHE Coordinator) and Keith Platt (Occupational Health and Safety Services). Orica is a significant user of contractor, especially on major shutdowns.

The attendee from **BOC** was Peter McManus (Project Manager - Operations Support). BOC is helped by having good global standards. Peter gave good feedback on the usefulness of the previous CIWG on Safety Management for Contractors.

The attendees from **Sydney Water** were Wayne Spencer and Samuel Lin from their Operational Contract Services group. Sydney Water uses alliance and other contractors for maintenance, major contracts maintenance, renewals and minor capital works and spend approximately \$40M pa.

The attendees from **BlueScope Steel** were Derek Sheppard (Maintenance Manager) Corey Bessi (Procurement Engineer) and Sharon Brown (Procurement). BlueScope Steel rely 100% on contractors for trades based maintenance and project work. They have a major alliance contract with Transfield.

The attendees from **ANSTO** were Warren Steele (Contract Cell Team Leader - Technical Services & Facilities Management) and Mark Winnell (Contractor Supervisor). ANSTO is a significant user of contractors, especially in the area of Facility and Building Maintenance. They were very interested in contractor selection.

Maintaining High Standards

Several organisations suggested they had company safety standards that were more stringent than what the Australian Standard required and more stringent than standard industry practice. It was generally agreed that these higher standards could only be enforced with contractors by constant vigilances on the part of the organisation's contracts, safety and management representatives.

It was generally agreed that to achieve good work and safety performance it is essential for the organisation and specifically contract supervisor to establish the respect of the guys doing the work. The overall project objective needs to be clearly enunciated and contractors need to feel that a good effort is expected from them and that poor workmanship or safety behaviour will be detected and will not be accepted. The message that high standards of safety are required and cutting corners on safety practices is not acceptable must come from the top of the organisation. Furthermore, if you want the contract staff to maintain the standards you must ensure that your own internal staff follow these standards.

Good contractor supervisors that are aligned to your organisations goals make managing contract personnel easier. One problem is that often contract companies make the best tradesmen into supervisors but often these people don't have the planning, organising and people skills that best suit the supervision role. Sometimes contractors will make the guy who is less good on the tools a supervisor. This can be OK if they have good co-ordination skills.

Maintenance Shutdowns – Teams

John R (Alcoa): Alcoa tend to use larger contractors that can take on a wide scope of work. The trade staff tends to work more co-operatively with each other and you can save money. For example, if both the electricians and plumbers from the same company need a cherry picker, they are more likely to share the one and reduce the costs to you.

Gus (Alcoa): There are 2 basic ways to operate

- Do and charge on a schedule of rates. This allows flexibility to move guys as day to day priorities change.
- Quoted rate on a fixed scope of work.

Alcoa have tried alliance partners but have had problems. As soon as you have something out of the ordinary you can have problems and you have less flexibility to respond.

Eddy (Hunter Water): Guys from different organisations tend to blame each other, "finger pointing". Agree that it is better to get a single larger organisation.

Peter (BOC): Sometimes this fails as the larger organisation just "subby" the work out, so you still have to deal with different teams anyway.

Greg (OneSteel): Arrangements for subcontracting can be made a criterion for issuing the job to the main contractor.

Terry (OneSteel): Many of our OneSteel contractors “live” on site or we always use a team of preferred contractors. Occasionally we need a specialist/expert who is not a “regular”. The contractors who live on site float people on and off site as demand changes. Guys effectively shared with other sites/organisations.

Greg (OneSteel): A key to getting good people is to guarantee at least 5 days work.

Terry (OneSteel): OneSteel does not have any trades staff any more. There is a tough criteria to get on to approved contractor list and once on the list they usually do well out of the relationship. Advantage to OneSteel is it can float people in and out as needed. For example, we have a Shut Down one day each week and the same guys come back each week. They know the work and OneSteel standards and do the work and go. There is some up front cost in building the relationship and introducing guys to OneSteel standards. If the contractor sends a new guy, he is watched carefully initially until the relationship is established. If he is no good, the contractor is advised.

On jobs there is normally a OneSteel rep who knows what needs to be done and safety practices required. The contractor also needs to have a supervisor to manage disciplinary and trade knowledge issues. The contractor will give a budget estimate for the work (say \$10k) and how he does the job and number of guys used is the contractor responsibility.

Greg (OneSteel): We might have 5 Downer electricians on a daily basis for regular maintenance and small jobs, whereas at Christmas there could be 30. I find it a lot easier to have quoted work. Say work scheduled for 1 month time. The contractor produces JSA's etc. and we just review. Alternate arrangement with hourly rate, if 10 guys turn up and say 4 are new, we need to baby sit the four new guys to make sure they do the right thing. It is a lot of supervision costs. If a new guy is good, he does not last, as we can not offer steady work.

Procedures need to be idiot proof, which is not usually possible.

Keith (Orica): We plan our Shut Down one year in advance and have one of our guys work with contracting guys jointly scoping work. Contracting company covers crane, mechanical, scaffolding, lagging, etc. All tasks are kitted up before Shut Down and contractors know what is in the job kit.

There are issues with inexperienced staff “need one of those round things with a hole in it” (a gasket). In 2001 we had a good Shut Down with guys coming from all over Australia. If your outage coincides with a big outage elsewhere, there is significant difficulty getting good tradesmen.

Terry (OneSteel): We stagger work on our plant to avoid overwhelming the labour supply.

Keith (Orica): Would be beneficial if the IMRt could maintained a register of manpower demands so companies could level demand. (Bluescope Steel later discussed how in the Illawarra and southern Sydney, they keep contact with other major contractor users to ensure they do not overlap their Major Shutdowns. This could be done for Sydney and Hunter areas as well if the key contractor users in were supportive of this system.

One issue for contract labour working (either individuals or through contractor hire companies) short duration jobs is maintaining continuity of work. Naturally, towards the end

of your project they are looking for the next job. If your work only lasts a few days and another job is available lasting for weeks, the best staff will tend not to remain on your job. What would you do in their circumstances?

Considering offering a loyalty bonuses, which only become available if the same worker stays until the job is completed. Think it will be a cost effective option and improved the quality of the work delivered.

If a contracting company is undertaking a job involving a lot of pipe work, they are expected to have a piping safety officer in their team.

Terry (OneSteel): Safety Observations and job audits. Everybody in management and supervision has a minimum number of safety observations they must perform. Contractors are easy targets for audits. There may be an audit theme for the day eg confined space, vehicle movement, etc.

Jillian (Orica): We give the subject of the audit a “scratchy” to compensate for the disruption and they can win a plasma TV.

Keith (Orica): It is all about being proactive about safety.

It was generally agreed that enforcement was critical. Serious non compliance must result in the person being escorted off-site. The same rigorous standards must be applied to your own staff. Otherwise the organisation loses credibility. High visibility of supervisors and management is important.

Terry (OneSteel): An example is a worker who walked through a restricted area on site. This resulted in him being escorted off site and he lost 2 day’s pay and he looked like a turkey. This sends the right message to the rest of the team. The senior staff from the contracting company was asked to explain and the guy was also reprimanded by the contractors management. We had no more occurrences.

Peter (BOC): We ensure supervisors spend minimal time in the office and most of the time on site to maintain maximum visibility. It was generally agreed that, particularly with transient workforce of contracted labour, these steps are vital to establishing and maintaining a strong safety culture so that the guys remind each other when someone overlooks a safety practice.

Hearing protection was seen as a difficult issue to enforce as ear plugs are uncomfortable.

Gus (Alcoa): The damage/injury from noise is not obvious like a burn. My technique is to tell the guy I can PROMISE him one thing, *“The facts are that with these noise levels you WILL lose your hearing if you do not wear ear protection. Please put your hearing protection on”*. This is very effective and it works better than saying you must comply with our rules.

It was agreed that the in-house guys must comply and be role models.

Safety signage has very little impact. People become blind to signs after a while.

John R (Alcoa): There are some guys out there that should be weeded out of the system as they are just totally useless.

There was general agreement that the smarter contractors are safety induction experts because they have been to so many different inductions and seen so many different practices that they can compare the good and bad of different site inductions. Should get them as more active contributors at inductions and use them to challenge your safety people who are often just giving a standard talk. We all could learn a lot if we could see issues through their eyes.

Greg (OneSteel): Asked, “How many of us here have done our own site inductions”? It is worthwhile to sit through one occasionally. I went to one and the guy was giving misleading information.

There was general agreement that training needs to be reviewed by site staff at the maintenance manager level. It is also good to have site staff (on refresher) and contract staff at the same induction. The site staff should be able to tell if trainer is off the rails. Remember that things change in the workplace, and industry standards change, so the induction needs to be kept up to date.

Terry (OneSteel): A driver for us to do regular re-inductions of all staff is the desire to maintain self insurer status. All people on site, employees, alliance partners and contractors carry the same type of passport. It shows the areas you are accredited to work in and the work you are accredited to perform. The passports can be requested at any time. Everybody is given a general (gate) induction (renewed 2 yearly) and specific inductions to areas as needed. We are having a rod mill Shut Down and everybody who enters the building (including managers) has to have completed a special Shut Induction. You must have an induction sticker on your hard hat or you don't get in.

There is always a shut co-ordinator and you can ask if you can do some additional (unplanned) work in the Shut Down. Usually the answer is NO as your work could impact on a planned job.

John M (Alcoa): The third page of our JSA/permit to work requires extensive review of potential impact on other concurrent work and we use this regularly to allow additional work.

Gus (Alcoa): Sometimes in our Shut Down, all that can be planned is to open the machine up and inspect. We do not know what is needed until we inspect. If the machine is on “my line” then it is “my call” on what we do after the inspection and how I control the additional scope.

There was general agreement that the key issue is that the work is under control and that there are systems in place of JSA's and Permits to Work to ensure potential impacts on others jobs are taken into account.

Planning of Jobs

The question was posed “How much planning do you delegate to the contractor”.

Greg (OneSteel): The Steel Mill work with contractor after they have prepared JSA's.

Generally agreed that for Shut Down work the planning is usually done by the plant owner but there is more flexibility for facility maintenance and small projects for contractors to do planning. Key is to use the contractor's skills. Those that are good planners organisers need to be given that role to maximise efficiency and effectiveness. The more things that is planned and carried out by the same person the better it is.

Training

There was discussion on the extent of training given to contractors. Many organisations that use regular contractors put contractors on a training matrix the same as their own staff. Thus ensuring they have the skills for the jobs assigned to them. They must have all the safety inductions relevant to the areas they go to but they may also need equipment specific training modules.

Some organisations used the company record system to remind regular contractors when their training is due. For example, if a forklift ticket was needed for some maintenance work they would be given a reminder 3 months before their training needed to be renewed the same as for internal staff. Monthly training reports are also issued. There are administrative overheads in this process particularly if there is high turnover of contract staff. However, such a scheme is needed to maintain compliance.

General good practice seems to be that contractors get included with training provided on site but the contracting organisation is billed for the cost of their participants. Training on instrument calibration includes both theory and practical training modules to show that they have the required competency.

A different approach is generally used for specialist contractors that come regularly but infrequently. For example, guys servicing HV switchgear are generally not included on the training register but they are required to bring evidence of the currency of their training before they start the job.

Eddy (Hunter Water): We have a many remote sites. There is no corporate group that looks after inductions and no contractor induction register. Generally, the contract supervisor gives inductions as needed. There is no standardisation in the inductions given and it is recognised that we need to improve here. Of a group of 20 regular contractors on an induction update only 1 had received previous induction to our sites.

We do perform audits to see if guys are following JSA and have the correct permits.

Gus (Alcoa): Previously I had a job as a wire rope inspector at mine sites. The frequency of these inspections was about the same as the re-induction frequency. I ended up with a glove box full of induction cards. It was time consuming and confusing going to 3 to 4 inductions per fortnight all with only subtle differences. There should be industry standards set for the basic induction information so that only site specific information is required at inductions.

Jillian (Orica): Our site contractors needs a re-induction after a 3 month gap in service. There was general agreement that it is worthwhile getting guys who work at a wide variety of sites to participate in reviews of your induction arrangements. Often they say "At X they do this and it is easier" and is always worth considering.

Derek (BlueScope Steel): We host apprentices from Illawarra group training. It gives the chance to pick good apprentices for us to put on. They may put them working for contractors but we pay their costs on the basis the 90% of their time is spent on our site. They are then available to hire directly when a position arises.

There is a need for a training level between a degree and a trade. As tradesmen progress up the organisational structure they can be too equipment focused rather than process focused, due to their equipment background. Degree engineers are often too technically focused.

Standardisation

At the previous Common Interest Workgroup (CIWG) on Contractor Safety, the point was made that some contractors are safety “inducted to death”. They go from site to site and are exposed to slightly different inductions and naturally have difficulty remembering the subtle differences between sites.

This CIWG had similar comments. The anecdote was given: When asked “Can I please see your induction card?” the contractor opens a folder with about 50 cards & “oh yes here is yours”.

As in the aforementioned CWIG the suggestion was made that IMRt Members consider facilitating some standardisation similar to that for the WorkCover green card used for construction sites.

It was agreed that guys who continually ignore safety need to be weeded out. There should be a way of recording penalties that are recorded against the industry wide card.

Derek (BlueScope Steel): BlueScope are moving towards site wide training and induction system with records kept on SAP. The Whyalla plant has a very good system.

Skills Shortages

There was a general discussion about finding trades staff for project, maintenance and building services work. There was unanimous agreement that good staff were very difficult to obtain. This situation is getting worse as very few places have extensive apprentice training programs although this is improving slowly.

The story was told that at one site, inexperienced young guys were employed as safety watchers for confined space work and when it rained he walked away. There have been some proposals to bring overseas tradesmen in on 1 to 4 year contracts.

Jillian (Orica): Ampol lost 300 contractors in one day towards the end of a Shut Down because guys looking for next job.

It was generally agreed that it would be good if industry co-ordinated Shut Down to even out demand.

Derek (BlueScope Steel): Transfield is the main alliance contractor at BlueScope Port Kembla and we stagger Shut Downs across our various plants these activities. As our process is serial, when our Blast Furnaces have a Shut Down (every 18 weeks) a number of other

plants shut as well. This creates a peak contractor requirement of 1,800 people and potentially could use 2,500 contactors if they were available.

Bluescope have had good experience with overseas welders.

Some of the contractor companies fly tradesmen from WA and Qld for large specialist jobs.

Derek (BlueScope Steel): We need to balance the work we schedule during the shuts against the labour available. Also some adjustments of Shut Down frequencies are made to balance labour. Fortnightly most Shut Down are much smaller at only about 300 to 400 people. Naturally, the longer the period between Shut Downs the better from process control perspective.

We are moving more to a schedule of rates as it is very hard to scope jobs involving rectifying process problems. We are trying to align set contractors to specific areas of plant. Bluescope employees do not do any hands on maintenance work it is all done by contractors.

Management of Larger Projects

Wayne (Sydney Water): At Sydney Water Capital Works we have a relationship with Transfield & SKM (tech support) and the system works as follows. We raise a project brief, and then the next 3 phases are performed by Transfield, which is scoping, design and delivery. There are gates, one at each stage where the project is assess and can be stopped. Transfield take the brief and produce a scoping document showing how the objectives are to be achieved. The first gate is when this comes back to Sydney Water for approval with the possibility of some scope adjustment.

When approved Transfield prepare a detail design for the work and writing technical specifications and tenders for the work. Under the contract, Transfield must comply with Sydney Water's procurement rules (three quotes above certain levels etc). During these first two phases we have an Upper limiting fee (basically a Schedule of Rates with a fixed upper limit). The Upper limit (around 5% of full capital works budget) applies across the full capital works program so Transfield can cross subsidise jobs with more up front cost against more routing jobs with less of a design element. Transfield have a mark up on their direct cost either with their own labour or their sub-contractors during the first two phases. With these design phases completed, Transfield provides a fixed price for delivery.

We monitor Transfield's performance using three KPIs.

Terry (OneSteel): The OneSteel system is to open project gates when project started but gate not closed until project is delivering benefit starts to be delivered to OneSteel. KPIs take account of complexity of project. KPI on engineering cost, schedule of delivery date. A rule of thumb is 350 days from concept to delivery. There are 5 gates.

Wayne (Sydney Water): We work on 15 months from program to delivery. Naturally with negotiation if project involves long lead time items. Also Sydney Water may adjust priorities depending on changing benefit of project to Sydney Water.

Sydney Water can kill a project at any of the gates if the subsequent costs are greater than original budget estimates or if engineering work reveals the benefits are not there. To stop

budget blow out Transfield are bound by Sydney Water's procurement rules and they are required to meet the quoted fixed price. Transfield carry the risk during the delivery phase. If extra cost was imposed on delivery because of Sydney Water operational reasons, extra funds are negotiated.

Peter (BOC): We found accounts were too hard to manage under that external engineering style of project management.

Wayne (Sydney Water): There is some conflict with the same group (Transfield) providing the scoping and design phases as well as delivery. We are considering changing that.

Terry (OneSteel): At OneSteel there is a OneSteel person who tracks (Manages) the project at all stages. All project reports go back to the OneSteel Project Manager. If he considers the project is going off the rails he can pull the plug at any stage. SAP only allows 105% of the budget to be paid. To get more the Manager needs to go to Managing Director to ask for more. We never blow out budget.

Peter (BOC): We have now gone back to in-house design because it was easier than controlling such processes.

Terry (OneSteel): It is not uncommon for a project team at OneSteel to recommend a proposal be abandoned as detailed work shows that the initially envisaged benefits are unlikely to be achieved. It was generally agreed that it is essential to monitor projects beyond handover from design/construction to see whether projects actually deliver the predicted benefit. If projects are getting through concept, scoping, detail design construction and commissioning but are not delivering benefit to the business the organisation needs to review its systems.

Teams must challenge a project at all stages if it does not look like it is on track to realise benefit, the earlier the plug is pulled or project redirected the better. OneSteel also uses a number of decision/ review gates where projects can be killed. Plant people sometimes do not know what they really want and some project ideas they do have are not viable. Of 80 proposals put forward last year, OneSteel canned 20 at early stage saving large amounts of money.

If the engineering alliance contractor does not meet a project KPI, they do work at cost (no profit. SOR still paid but profit margin on top is not paid if we do not meet KPIs. The KPI's are:

- a) Ratio of engineering to total installed cost
- b) Schedule of project delivery (averaged over all projects) monitored monthly
- c) Safety

Wayne (Sydney Water): So the difference between these 2 models is Sydney Water is not carrying delivery risks as Transfield carries delivery risk whereas OneSteel is carrying risk not WorleyParsons.

Another model briefly discussed is the BOM (Build, Operate and Maintain) model. No participants spoke about this model other than to note it provided incentive to build a reliable and maintainable plant but did distance the plant owner further from the decision making about equipment used. There are risks if the Operate and Maintain phase is not long enough

that the contractors can make poor life cycle cost decisions when building without negative consequences. Long term problems will always come back to the asset owner.

Peter (BOC): We use an internal design teams for Major projects and Upgrades. We see great advantage in maintaining in-house key process design expertise, as we have greater control over project costs and performance. Cryogenics is a unique field so it is important to keep expertise in house. The Cryogenic expert would not manage the project, just provide technical expertise to specify and define the design.

Each site lists their issues, problems and opportunities and the project group helps develop a business case for each and then advise on the ones likely to give the best ROI.

Terry (OneSteel): We also use project ranking tools, which takes many criteria into account. Each project has a sponsor at GM level. The project team made up of a manger, construction supervisor and design engineers.

It was generally agreed that projects can appear to be more expensive when contracted out when compared to when they are managed internally. This can be because all costs associated with a project are captured on project cost when it is contracted out but often some are hidden when managed internally. It is important to capture all the costs associated with projects because it can be counted as capital cost and have associated tax benefits. For example, a CAD engineering costs on average \$1,000 per drawing at OneSteel and this is quite good as the average cost can be much greater.

Smaller Projects and General Maintenance

Eddy (Hunter Water): Contractors view the our jobs and put in a price. Generally we get 3 quotes. If on a current job one contractor is significantly under the market rate, this leaves a problem, as it is likely that they do not have the expertise to do the work if they have underquoted so much.

Hunter Water prepares the scope and select contractors from the pre approved panel of contractors, who submit their quotes. Ideally, all contractors are to be shown the job at the one time and it is important to take steps to ensure they are all given the same information. Also it can be time consuming showing jobs to contactors separately at remote locations.

Mark (ANSTO): We use period contracts and for jobs over a certain size a quote is needed.

Warren (ANSTO): Some services (like six monthly air conditioner, air compressor or photocopier servicing) are based on a per unit price. We get contract tradesmen in for regular maintenance, we control all their work through work orders and charging is against a Schedule of Rates (SOR). If they observe the need for additional work they think should be performed, they are to report back and we decide if it is to be added to the work list.

Currently we have panels of each trade i.e. a selection of electrical providers, a number of plumbing providers, a selection of painting contractors, etc. Thus for jobs involving several trades we need to provide a lot of resources for coordination. With the increasing work load we are “outgrowing” the present system. We consider that our work demand is insufficient for an alliance arrangement. We need somewhere between day to day management of individual trade groups and an alliance contract.

Generally, our current system works well but use of a contractor with a wider range of skills may be better. It was generally agreed that internal resources would be less stretched if a contractor with the ability to provide and supervise a range of trades was used on jobs involving several trades. However, this does not mean that an ANSTO overview should be removed as the organisation needs to remain in overall control. If you have a trustworthy contractor both ethically and competency you minimise your costs. You need to maintain the in-house expertise to assess the service being provided and to ensure in-house activities are allowing them to operate efficiently. The organising of many different unrelated groups working on the same job was likened to trying to organising seagulls fighting over chips at the beach. Under this model the contractor's supervisor (no tool work) is also paid at an hourly rate.

For example, a simple room refurbishment could involve 4 separate contracts, electrical work, partition movement, false ceiling installation, painting, and possibly plumbing. If all the trades are lined up it could be done in a week if not it could take a month. One as discussed option is to contract someone to do the full job refurbish this room in a week and it is his responsibility to employ or sub out all the work as needed.

Gus (Alcoa): This model of selecting one larger contractor was used effectively when as engineering manager I was responsible for moving a factory.

Warren (ANSTO): Alternatively, we could employ another planner to free up our contractor supervisors. The problem here is that ANSTO does not have sufficient "pull" (control of availability) over the contracting resources as a large project management contractor would. Having a planner works well with employees as he can dictate who does what when.

Corey (BlueScope Steel): Another option is to contract one (of the original 4) as team leader, say the building contractor who is doing some of the work, and pay him a mark up to supervise the other contractors. Other contractors are still contracting to ANSTO and paid by ANSTO but are jointly selected by the team leader contractor and ANSTO. Team leader has incentive to get a reputation as a good coordinator to continue to get the team leader mark-up on the work. This can be cheaper and keep ANSTO in control of who does the work.

Gus (Alcoa): This works well for us also. The fee for service can have traps as you need to keep involved to ensure there is not a contractor pyramid i.e. 10% markup on a 10% mark-up etc. when contractors hire subcontractors.

Warren (ANSTO): For general maintenance work, such as a broken door knob we have period contractors working on a SOR. We have supervisors to ensure the booked times are reasonable. We have found that the "one man band" contractors are good for this sort of work. Their contract with ANSTO is very important to them and they give us good work for a good price. Once they put other workers onto wages the workers show less commitment to ANSTO.

Gus (Alcoa) & Peter (BOC): There is a "game" to be played, where you have to check up say monthly and protest vigorously about slack behaviour. If an organisation is offering work on SOR it needs to have supervisors who know how to do the job and can tell if it is done well or you can end up paying too much for the first time and have to pay to have it done again.

It was generally agreed that there is a sliding scale of level of supervision from 100% for new SOR contractors to a minimal level of supervision for well known and trusted contractors on lump sum jobs.

Maintenance Shutdowns – Teams

Samuel (Sydney Water): For maintenance work each Work Order should have the standard hr needed for completion. Actual hours spent are recorded at the end of the job and the ratio can be compared and reviewed on exception. For Sydney Water the Work Orders are generated by Maximo.

Warren (ANSTO): For our fix time maintenance, we specify KPI e.g. 90% of all maintenance must be completed on time and a 1 hr response time to attend urgent maintenance etc.

Paperwork Issues

It was generally agreed that contract worker should enter times into their work our into the CMMS system such as Maximo or SAP to reduce the paperwork burden. A problem is that for each job, if he does say 16 different work orders in a day, you do not want 16 invoices generated. They should be rolled up say monthly for the one contractor. Automating this can be difficult.

Automatic payment can be used by some organisations but usually is not done until confidence in the contractor is established.

It was generally agreed that there needs to be clear arrangements on who supplies what for a contract.

Greg (OneSteel): Negotiate with each contractor who supplies gloves, overalls etc. For example, to get full boilermaker rates the contractor needs to supply their own welding and oxy gear. It was generally agreed that if a contractor comes as requested to do a job and site operational reasons prevent them from working, then you still must pay them for the day. Generally, organisations try to find another job that they can do for that day and reschedule the original job.

Derek (BlueScope Steel): If a price has been agreed with the contractor supplying certain items but they still take them out of the store the cost is subtracted from their payment.

Some discussion on Contractor balanced scorecard followed. It was considered very difficult to factor in interruptions to the work.

Other Payment Schemes

Corey & Sharon (BlueScope Steel): We also use a hybrid scheme where the contractor gives a quoted range say \$80 to \$120. This recognises that it is difficult for a contractor to give a fixed cost as not all the issues are know before the job starts so on fixed price the contractor must factor in a contingency margin. However, payment is capped at the upper end of this range. Contractors will gain a bad reputation and get less repeat work if they always come in at the upper end. Occasionally we get competitive quotes to check pricing.

Often the fixed price quote is 50% higher than what we actually pay on this scheme. The administrative cost is not much greater than other schemes.

There was a general view that plant maintenance contractors are more disciplined than facility maintenance contractors.

RCA

There was some discussion on the general use of RCA (Root Cause Analysis) with the problem of ensuring the actions generated are actually closed out improvement work was discussed.

It was considered difficult to get guys to focus where the defect was introduced in the first place to understand root cause of a problem.

John R (Alcoa): Alcoa Yennora gets significant benefit from the use of simple 5-Whys RCA analysis.

It was generally agreed that the cost of implementing RCA actions is much greater than the cost of generating the actions. Where RCA is performed and contractors are involved in the maintenance it is important to have them involved. The benefits of the analysis and actions need to be monitored to assess effectiveness of RCA and close out process.

Retention of Knowledge

It was generally agreed that whether you use your own people or contractors it is essential that proper records be entered into the CMMS. In some cases alternate front end entry systems were used so contractors had a simple interface but the information should go into the corporate system and not be put into an isolated system run by the contractor.

Maintenance contractors need to report back about their observations about plant defects either into report or inspection sheets or directly in CMMS system. To collect good maintenance history for a plant requires considerable effort and follow-up by local plant owners.

John R (Alcoa): Gave an example where the maintenance of cranes had been outsourced. The contractor had modified brakes to a design they supplied. When the arrangement ended there were significant problems maintaining these brakes as the supply of components became very expensive.

Also Alcoa has had significant problems getting auditing of cranes done externally as external service providers tend to be very risk adverse and would readily classify a crane as non-compliant with relatively minor issue. This has the potential to cause major operational disruptions. Auditing and Life Extension work for cranes is now carried out in-house.

Inspection and Test Plans

A question was asked about use of ITP's (Inspection and Test Plans) with contractors.

Jillian (Orica): Indicated that for critical work on shutdowns the work orders have ITP's that specify the critical hold points. Contractors must call in the defined local expert/ quality team who will sign off of specific tasks before the contractor can proceed to the next step. This is a key quality control system for critical safety or operational risk issues.

Derek ((BlueScope Steel): ITP's are used successfully by Transfield in areas such as the Blast Furnaces at the Port Kembla steel works. The recorded ITP information is input into SAP.