

BRINGING RISK ASSESSMENTS TO LIFE BY INTEGRATING WITH PROCESS MAPS

Gordon Sellers¹, Alan Webb² and Chris Thornton³

¹Safety Management Consultant, 34 Westbury Road, Northwood HA6 3BX, UK.

E-mail: gordon.sellers@dsl.pipex.com

²Poplars Landfill General Manager, Biffa Waste Services Ltd

³Milton Keynes Depot Manager, Biffa Waste Services Ltd

As one of the leading integrated waste management businesses in the UK and operating from over 160 locations nationwide, Biffa has many thousands of task-specific risk assessments. These are used by managers as input to local operating procedures and meet statutory requirements.

Following a tragic accident in 2006, Biffa decided to develop process maps for all its locations, focussing on vehicle-pedestrian interactions. The methodology was embryonic, however most managers found that their process maps gave a much better overview of operations than their existing risk assessments, which are not very 'user-friendly' and are slow to search.

Therefore Biffa initiated a project to integrate the best features of risk assessments and process maps. The resulting 'Process & Risk Assessments' (PRAs) used Excel spreadsheets, which are widely used throughout the company, and included thumbnail photographs to make them more readable. Following development of the methodology at one location by a safety professional, six location managers 'volunteered' to develop pilot PRAs for their own locations. The pilot site results were reviewed and found to be a significant improvement on the existing separate risk assessments and process maps.

Phase 2 of the Process & Risk Assessment project is underway at the time of writing this paper, and is developing standard best practice modules which each location will then use to indicate where physical constraints make it impossible to implement the full best practice – and therefore what additional control measures have been put in place. By the time of Hazards XX, we expect to be able to report the results of phase 2.

EXISTING RISK ASSESSMENTS

Biffa Waste Services employs more than 5,000 employees, operates over 1,500 vehicles and 160 operating locations including collection depots, recycling facilities and landfill sites. In the early 1990s, three-page risk assessments were introduced to assist managers to control the risks in their operations and to meet the company's statutory requirements under the Management of Health and Safety Regulations, subsequently an online one-page version was introduced to simplify the process. A typical location has 80 to 180 task-specific risk assessments depending on the complexity of its operations and, in total, there are around 30,000 risk assessments on the company intranet. Each responsible manager is required to review and update his or her risk assessments at regular intervals, normally annually.

PROCESS MAPPING – FIRST STEPS

Following a tragic fatal incident in 2006, Biffa's Chief Executive decided that the company should develop process maps for activities at its locations. These Excel-based process maps included risk assessments and, where appropriate, proposals for actions to reduce risk. The initial focus was on vehicle-pedestrian interactions but the scope was later widened to all activities at each location. The methodology was embryonic and was used in some haste, however the resulting process maps were generally felt to give a more complete risk picture than existing task-based risk assessments and to have led to worthwhile improvements.

DEVELOPING INTEGRATED PROCESS MAPS AND RISK ASSESSMENTS

Biffa now had two parallel systems of risk assessment:

- The 30,000+ existing 'text & tables' risk assessments on the company intranet.
- Around 150 Excel files each containing 5-10 process maps, duplicating some of the information from the existing risk assessments, uploaded onto the company intranet.

This was obviously unsustainable in the medium term so the Board decided to investigate merging the two systems into one. A project team was set up comprising a health & safety project manager, along with representatives from the operating divisions. We first reviewed the existing risk assessment process:

- ✓ Linked into the company's system for tracking actions and review dates (known as the 'Compliance Database').
- ✓ Well over 500 generic risk assessments have been developed for common activities across the company and each location is required to adapt the relevant ones to their own situation, but ...
- × ... there is no simple way to ascertain if a specific location has implemented 'best practice'.
- × Slow to download from the company intranet so it is a time-consuming task for managers to review and update them.
- × No links between the task-specific risk assessments so it is difficult to check that no significant risks have been overlooked 'in the gaps', especially interactions between separate activities in adjacent areas.
- × Output is not 'user-friendly' and is therefore unsuitable for use as briefing documents or toolbox talks for the majority of the workforce.

Similarly we reviewed the process maps:

- ✓ Visually show links between different activities so easier to review for any gaps and to discuss with operatives whether or not they accurately represent the activities carried out in practice.
- × Not standardised across the company so no facility to promote best practice.
- × Not linked into the Compliance Database so no automatic tracking of actions and review dates.

Therefore we set out to develop a system of Process & Risk Assessments to combine the best features of risk assessments and process maps. If successful, this would then replace both systems.

We developed the first draft based on a location which has three business units—an industrial/commercial collection depot (effectively a heavy vehicle park), a heavy vehicle maintenance workshop, and a transfer station (here Biffa vehicles and other customers from the local area tip their loads, from which recyclables are reclaimed and the residual waste is loaded into 44 tonne articulated trucks for despatch to landfill). During this period, Biffa had organised a series of IOSH 'Managing Safely' courses so that was an excellent opportunity to present the early drafts and get very useful comments from the managers who were attending, also the drafts were reviewed with Biffa's health and safety professionals. As a result of these consultations, we made significant improvements to the drafts, probably the most significant being to include thumbnail photographs.

From this first draft, we developed a template process & risk assessment which was issued for pilot implementations to be carried out by 'volunteer' managers at six representative locations – two industrial/commercial collection depots with vehicle workshops, one of which included a secure waste recycling facility; a municipal collection depot and workshop; a major landfill with composting and a municipal depot; a special waste treatment plant and transfer station; and an integrated waste management facility operated by Biffa at a customer site.

At the end of the pilot implementations, we held a review meeting at which the six location managers presented their findings to the responsible operating directors. They reported both the positives and negatives:

- ✓ Easy to follow and understand
- ✓ Logical process that makes you think of everything
- ✓ Pictures aid discussion with team – and involve them
- ✓ Comprehensive overview of activities on site, great for training
- ✓ Customer positive
- ✓ Improved understanding of ancillary plant operations
- ✓ HSE was positive about the approach
- ✓ Only ~ ½ day required to tailor the template at one similar location
- ✓ Key Safe Behaviours emphasise need for reinforcement
- ✓ Minimal IT training needs as all managers familiar with Excel
- × Excel file too big and cumbersome to edit and eMail (largely because the photograph files had not been reduced in size)
- × Significant time needed to develop initially
- × Not structured to print out relevant sub-sections e.g. for project pack or for contractor working in small area of site
- × Without an index, not easy to find way around
- × Repetitive e.g. PPE, slips & trips come up in many tasks
- × Concern that the format might not be acceptable to lawyers handling an injury claim
- × Not as good for a special waste treatment plant as the 'complex risk assessments' which had been developed locally

Following the presentations and discussions, the operating directors recommended two important improvements:

- To avoid different practices at different locations with similar operations (partly due to historical reasons following business acquisitions), the process & risk assessments should positively promote a standard best practice approach at locations.
- As far as possible, the process & risk assessments should use non-technical language so that they can be used directly for initial induction training and refresher training without needing further materials to be developed.

PHASE 2 PROCESS & RISK ASSESSMENTS

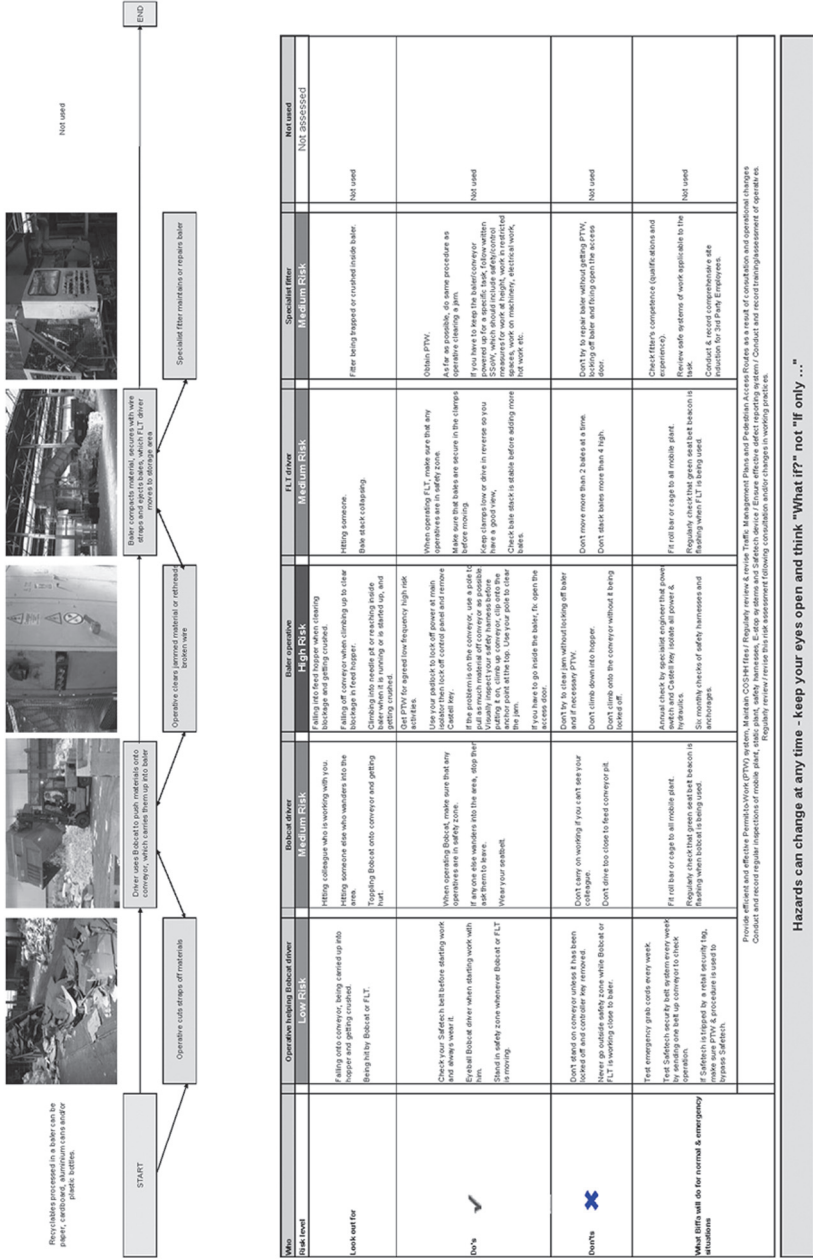
This work is currently in progress and ‘best practice’ process & risk assessment modules are being developed for the activities and tasks covered in the pilot implementations. These will be reviewed by the divisional best practice working parties and rolled out for a phase 2 series of pilot implementations at a different set of representative locations than used for the phase 1 pilot implementations, before being rolled out across the company.

Important differences from the phase 1 template are:

- Formal language has been replaced by more commonly used language (e.g. ‘Hazards’ has become ‘Look out for’, ‘Make eye contact with mobile plant operative’ has become ‘Eyeball the driver’). This may sound trivial but is expected to have a major impact for use in training sessions. See Figure 1.
- For the same reason as above, the technical parts of each process & risk assessment are now on a manager’s page – risk ranking; lists of key safe behaviours; references to legislation, company standards and training materials. See Figure 2.
- There is a formal statement of company best practices on the manager’s page, with a requirement to state any issues where the local situation prevents use of the best practice and what other measures are in place to control risks.

By the time of HAZARDS XX we expect to report on experience of rolling out the process & risk assessments across all of Biffa’s locations.

To roll out the process & risk assessments company wide, we anticipate that each business unit manager will probably spend one or two days adapting the relevant modules to his or her location (including pasting in local photographs and discussing with supervisors and workforce representatives). These will replace the existing risk assessments and process maps, and will also be useable for induction of new employees and toolbox talks for experienced employees. Thereafter routine reviews (typically annual) will take less time than the typical ½-day for reviewing the existing risk assessments and process maps – and will be more effective.



Recyclables processed in a baler can be paper, cardboard, plastic and metal or plastic bottles.

Not used

Who has the task?	Operative handling Baler/driver	Baler/driver	Baler/driver	Baler/driver	FLC driver	Specialist filter	Not used
Look out for	LOW RISK	Medium Risk	High Risk	High Risk	Medium Risk	High Risk	Not used
Look out for	Falling onto conveyor, being sent up job before and getting material. Being away Baler or FLC. Check your Safety harness before starting work and always wear it. Eye ball Baler/driver when starting work with bin. Stand in safety zone whenever Baler or FLC is running.	Hitting colleague who is working with you. Hitting someone else who wanders into the area. Tipping Baler onto conveyor and getting hurt. When operating Baler, make sure that any operators are in safety zone. If any one else wanders into the area, stop the baler to be safe. Wear your seatbelt.	Falling into the conveyor, use a job to get out. If the problem is on the conveyor, use a job to get out. If the problem is on the baler, use a job to get out. If you have to go inside the baler, FL, open the access door. Don't lean on anything if you can't see your own feet. Don't climb down into hopper. Don't climb into the conveyor without being instructed.	Falling into the conveyor, use a job to get out. If the problem is on the conveyor, use a job to get out. If the problem is on the baler, use a job to get out. If you have to go inside the baler, FL, open the access door. Don't lean on anything if you can't see your own feet. Don't climb down into hopper. Don't climb into the conveyor without being instructed.	When operating FLC, make sure that any operators are in safety zone. Make sure that bales are secure in the clamps before moving. Keep clamps low or drive in reverse so you have a good view. Make sure that bale stack is stable before adding more bales. Don't move more than 2 bales at a time. Don't stack bales more than 4 high.	Filter being trapped or crushed inside baler. Obtain PTV. If for any possible, do some procedure as operative (cleaning a jam). If you have to keep the baler cover powered up for a specific task, follow within the safety zone. If you have to work at height, work in restricted area. If you have to work on machinery, electrical work, etc.	Not used
Don't	Don't stand on conveyor unless it has been locked off and counter air removed. Never go outside safety zone while Baler or FLC is working close to baler. Test emergency grab cords every week. Test Safety harness belt every time you work by sending one ball to conveyor to check operation. If Safety harness is not used correctly, it will be replaced by a specialist. Bypass Safety harness.	Don't lean on anything if you can't see your own feet. Don't climb into the conveyor without being instructed.	Don't lean on anything if you can't see your own feet. Don't climb down into hopper. Don't climb into the conveyor without being instructed.	Don't lean on anything if you can't see your own feet. Don't climb down into hopper. Don't climb into the conveyor without being instructed.	When operating FLC, make sure that any operators are in safety zone. Make sure that bales are secure in the clamps before moving. Keep clamps low or drive in reverse so you have a good view. Make sure that bale stack is stable before adding more bales. Don't move more than 2 bales at a time. Don't stack bales more than 4 high.	Obtain PTV. If for any possible, do some procedure as operative (cleaning a jam). If you have to keep the baler cover powered up for a specific task, follow within the safety zone. If you have to work at height, work in restricted area. If you have to work on machinery, electrical work, etc.	Not used
Don't	Don't stand on conveyor unless it has been locked off and counter air removed. Never go outside safety zone while Baler or FLC is working close to baler. Test emergency grab cords every week. Test Safety harness belt every time you work by sending one ball to conveyor to check operation. If Safety harness is not used correctly, it will be replaced by a specialist. Bypass Safety harness.	Don't lean on anything if you can't see your own feet. Don't climb into the conveyor without being instructed.	Don't lean on anything if you can't see your own feet. Don't climb down into hopper. Don't climb into the conveyor without being instructed.	Don't lean on anything if you can't see your own feet. Don't climb down into hopper. Don't climb into the conveyor without being instructed.	When operating FLC, make sure that any operators are in safety zone. Make sure that bales are secure in the clamps before moving. Keep clamps low or drive in reverse so you have a good view. Make sure that bale stack is stable before adding more bales. Don't move more than 2 bales at a time. Don't stack bales more than 4 high.	Obtain PTV. If for any possible, do some procedure as operative (cleaning a jam). If you have to keep the baler cover powered up for a specific task, follow within the safety zone. If you have to work at height, work in restricted area. If you have to work on machinery, electrical work, etc.	Not used
What else will do for normal & emergency situations	Provide effective and effective Personal Protective Equipment (PPE) - safety harness, E-stop, stop and safety harness, E-stop, stop and safety harness, E-stop, stop and safety harness. Conduct and record regular inspections of mobile plant, static plant, safety harness, E-stop, stop and safety harness, E-stop, stop and safety harness. Conduct and record regular inspections of mobile plant, static plant, safety harness, E-stop, stop and safety harness, E-stop, stop and safety harness.	Don't lean on anything if you can't see your own feet. Don't climb into the conveyor without being instructed.	Don't lean on anything if you can't see your own feet. Don't climb down into hopper. Don't climb into the conveyor without being instructed.	Don't lean on anything if you can't see your own feet. Don't climb down into hopper. Don't climb into the conveyor without being instructed.	When operating FLC, make sure that any operators are in safety zone. Make sure that bales are secure in the clamps before moving. Keep clamps low or drive in reverse so you have a good view. Make sure that bale stack is stable before adding more bales. Don't move more than 2 bales at a time. Don't stack bales more than 4 high.	Obtain PTV. If for any possible, do some procedure as operative (cleaning a jam). If you have to keep the baler cover powered up for a specific task, follow within the safety zone. If you have to work at height, work in restricted area. If you have to work on machinery, electrical work, etc.	Not used

Hazards can change at any time - keep your eyes open and think "What if?" not "If only ..."

Figure 1. Process & risk assessment top page

SOE Boiler...demo.xls		Large Boiling Machine		Best Practice Model SOE Issue.xls	
For manager's use only					
Task specific requirement	Identify tasks to be done off materials	Identify to path recyclables into conveyor	Identify to move bins to storage area	Personal practices	Personal practices
Objective	Minimise Risk				
Method	1. Last time accident 2. Over 10 in 40 years in data	1. F FATAL 2. Over 10 in 40 years in data	1. F FATAL 2. Over 10 in 40 years in data	1. F FATAL 2. Over 10 in 40 years in data	1. F FATAL 2. Over 10 in 40 years in data
Risk	Low Risk	Medium Risk	Medium Risk	Medium Risk	High Risk
Level of autonomy of any activities to be retained into Compliance Database					
Area 1	New COS2007 compliance checks are issued complete with, then completion of approved heavy maintenance jobs				
Area 2					
Area 3					
Key Safe Behaviours	RFQ requirements	RFQ Evidence	Company Standards & Evidence References	Company Best Practice	Best practice is not possible, what controls measures are in place
Issue repair part without training & authorisation	H41001 / J4006	H40120 - Recover Paper Safety H41003 - Safe transport in waste management and recycling facilities	OS002 - Control of tools at work OS003 - Organised Permit to Work OS004 - Production Vehicle Segregation	Safe conveyor belt to be fitted with a bin sensor to length of the conveyor with full control component of repair allowed but can be restricted easily	Best practice in place
Use waste of mobile plant	H41101	H41001 - Near loading of recyclables (RFQ) with remote assistance	OS001 - Production Vehicle Segregation	Safe operators working in proximity of a conveyor to wear a belt which trips the conveyor if it is moved up	Best practice in place
Challenge unauthorised persons in working area	OS004	Minimum mechanical safety requirements for all safety components and use lock in the worksite, restricting and isolating - industry best practice	OS002 - Organise an obstacle	All access points through which operators could enter loop 288 a hazardous machine are protected by a key-switch or electrical isolation system	Best practice in place
Lock off a machine before working on the conveyor baler			OS004 - Working at Height Using Mechanisms	All opening of access points into a hazardous machine are under permit to work which requires permit for locking of an end actuator system	Best practice in place
Safe stacking of bins			OS004 - Working at Height Using Mechanisms	Mobile plant to be fitted with audible warning alarm and, if new mobile is introduced, with CCTV	Best practice in place
Cut away from transport			OS004 - Working at Height Using Mechanisms	Maintenance to hazardous machinery to be carried out only by specialist fitters unless competent and trained	The maintenance company is specialised, permit, safe now developing some COS2007 compliance checks
			OS004 - Working at Height Using Mechanisms	Mobile plant operated to wear seat belt and this is indicated by flashing amber light	Best practice in place for all data pack, exception to permit plant on road to operate where facility not available
			OS004 - Working at Height Using Mechanisms	Mobile plant to be fitted with audible warning alarm and, if new mobile is introduced, with CCTV	Best practice in place
			OS004 - Working at Height Using Mechanisms	Emergency procedure 'Revised' can include later 'need colour' to place a further procedural, consider as tripped, or conducted every 20 minutes	Best practice in place
			OS004 - Stored Energy in Large Horizontal Sliding Mechanisms		
RFQ	Approved for Issue				
15/09/2007	0.1/0/0/0				

Figure 2. Process & risk assessment manager's page

CONCLUSIONS

For Biffa, which has large numbers of drivers and operatives operating from many locations and undertaking many similar activities, changing from the existing risk assessment system to an integration of process maps with risk assessments offers the prospect of a system in which hazards are less likely to be overlooked, which reinforces standard best practices, which is immediately usable for training purposes – and which is less cumbersome to review and update.