Plant Hazard Analysis & Risk Assessment

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Model: Forst XR8D

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Person conducting assessment:

This Hazard Identification and Risk Assessment document is Model specific. It is based on the knowledge that all new machines of this model were/are produced to the same specification and design. It assumes all examples of this exact model currently in service to be as per the original specification, and to have been and continue to be operated and maintained in accordance with the Manufacturers requirements, and with all applicable statutory and regulatory requirements of an original example of the Model for which it was prepared. This Assessment must be reviewed by all stakeholders as required:

- Having regard to the manufacturers approved options
- Having regard to the general arrangement of miscellaneous equipment or facilities that may be provided on the plant according to the end users requirements or specification
- According to the particular circumstances under which the plant is used and maintained
- As new Hazards are identified and/or as risks are reassessed
- As existing risk control measures are revised or new risk control measures are introduced and implemented
- As and when work procedures are altered or revised
- Having regard to any unauthorised alterations or modifications made to the design or operation of the equipment

Monitor have made every attempt to identify all reasonably foreseeable operating circumstances in preparing this Assessment, however no guarantee as to the completeness of this Assessment is provided or implied.
It is the responsibility of Owners, Employers and Operators to identify all hazards associated with the use of this equipment specifically applicable to the task to be carried out and to where the equipment is to be used or located. They must assess the risk potential for each of the identified hazards and ensure that all reasonably practicable steps are taken to ensure those risks are effectively controlled.

- All operators must be trained and competent in the safe use of this particular piece of equipment, and hold appropriate qualifications as required by applicable regulatory requirements
- Operators of the equipment to which this Plant Risk Assessment refers must read and understand the Instructions for Use and Warnings contained within the Operators Manual prior to use
- All Daily Pre-Start Checks, Routine and Periodic Inspections, Maintenance and Repairs to this equipment must be carried out in accordance with the requirements of AS2550.10-2006

ID	Description of Hazard Potential		Activity	Risk control measures already implemented	Risk	Supplementary risk control measures	Risk score
	Origin	Consequence					
1	Operator Competency						
1.1	Untrained operator, not following proper operating procedures. Distracted operator. Following a poor system of work. Operator working alone.	Entanglement (amputation/death) Laceration / cuts / bruises / fractures Serious injury or death	Set up Operation Maintenance	Operation instructions explained in operator's manual	C4 Extreme	Train operators on safe use of the plant. Operator training should include at least the following: • pre-operation inspections • safe operation of plant • regular maintenance tasks • understanding of plant operation • capabilities and limitations • emergency procedures Do not operate the plant unless proper training has been received. Ensure operator's manual is kept with the plant for reference. Do not operate the plant when distracted, ill, excessively fatigued, or under the influence of drugs or alcohol. Implement appropriate system of work based on manufacturer's recommendations (e.g. operating instructions shown in operator's manual).	B1 Low
1.2	Misuse Unauthorised use of plant	Entanglement (amputation/death) Laceration / cuts / bruises / fractures Serious injury or death	Operation	Operator's manual warns about not using the plant for other than its intended purpose.	C4 Extreme	Do not use the plant for any other purpose than its intended use as explained in the operator's manual. Do not operate the plant unless proper training has been received.	C4 Extreme

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						Keys are not to remain in an unattended machine.	
2	Plant Limitations						
2.1	Excessive incline causing plant to overturn	Roll over	Driving Operation	Operator's manual recommends that you do not drive on ground with an incline in excess of 20°.	C3 High	Do not drive the plant over ground slopes which exceeds its limitations. Drive with tracks expanded to give better balance. Avoid driving on ground too soft to support the machine's weight. Make sure the engine and hydraulic oil are warm before working on inclined ground. If the machine has to be stopped on an incline, make sure that the machine is pointing either up or down the slope. Also chock both tracks at the downhill end.	B2 Low
2.2	Drive acceleration	Roll over Being runover Contact with other workers	Driving	The chipper may only be moved by means of hold-to-run control. Levers must be activated continuously in order to drive.	C4 Extreme	Do not drive at fast speeds. Avoid harsh use of the levers as both levers used in extreme opposition will cause the machine to spin on its axis. Avoid driving on ground too soft to support the machine's weight. Be aware of other persons near and around the plant. Maintain visual contact with the direction of travel.	B2 Low

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3	Operation						
3.1	Damaged control panel	Crushing Impact	Set up Operation		C2 Medium	Regularly inspect control panel.	A1 Rare
3.2	Moving chipper into position	Overturning Crushing	Driving Set up	Follow maximum inclination limits set by manufacturer. Found in operator's manual.	C4 Extreme	Carry out job site risk assessment to determine suitability of the site before commencing any work. Avoid driving on steep ground; find alternative routes whenever possible. Do not drive at fast speeds. Avoid harsh use of the levers as both levers used in extreme opposition will cause the machine to spin on its axis. Avoid driving on ground too soft to support the machine's weight. Do not stand on the lower side of the plant while driving on steep ground. Never drive across steep ground, always drive with the tracks parallel to ground inclination.	B2 Low
3.3	Set up	Struck by flying debris – sticks, branches, timber	Operation	Operator's manual states when in use, woodchip and debris are ejected with considerable force from the chute and can travel up to 10m.	D3 High	Ensure only operators are within work area - ensure the exclusion zone is in place and operational. Do not allow discharge to be directed onto roads or public rights of way. Make sure the chute directs woodchip to a safe location so that no one can be harmed or property damaged.	B2 Low

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3.4	Prestart inspection	Laceration / cuts / bruises / fractures	Operation	Prestart inspection as per manufacturers recommendation. Chipper fitted with - E-Stop - Forward reverse buttons - Stop bar		Ensure any fitted safety devices or equipment are in good condition and functional during Pre-start check.	A1 Low
3.5	Uncontrolled movement of plant components	Entanglement (amputation/death) Laceration / cuts / bruises / fractures Serious injury or death Muscular stress / Musculoskeletal Disorder	Set up Operation Maintenance Cleaning Troubleshoot	Prestart inspection as per manufacturers recommendation. Feed and engine speed are controlled with a "No Stress" function ensuring that cutting conditions are kept within optimum limits. This maximises throughput while minimising jams and blockages. There will be times when material is being cut and the feed will momentarily stop until engine speed increases. At this point, the feed will start without warning.	C3 High	Isolate power to plant and remove the main switch key when performing maintenance and cleaning tasks. Maintenance to be carried out by a competent person. Pay attention to hazard decals to machine.	B2 Low
3.6	Operator safety	Entanglement (amputation/death) Laceration / cuts / bruises / fractures Serious injury or death	Set up Operation Maintenance Cleaning Troubleshoot	Ensure operator: - Has no loose clothing or jewellery, hair tied back - Has snug fitting PPE with no cuffs or strings - Has clothing tucked in where applicable.	D4 Extreme	May require dust mask dependant on type of timber being chipped.	B2 Low

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				- Is provided with correct rated hearing protection. - Safety footwear			
3.7	Feeding material into chipper	Entanglement (amputation/death) Laceration / cuts / bruises / fractures Serious injury or death Muscular stress / Musculoskeletal Disorder	Operation	Operator's manual recommends that you do not try to force material over 203mm in diameter or 254mm wide into the machine. Use speed (RPM) as directed by manufacturer. Do not exceed.	D4 Extreme	Ensure material to be chipped is clear of metal, stones, plastic, fauna, pests, diseases, rope or other contamination. Ensure material of suitable size for chipper. De-limb/cut as required. Load materials from side of in-feed chute. Do not stand in front during loading. Place butt-end first. Push short stubs through with longer branches. Lay shorter branches of top of longer ones. Do not place hands or body parts into in-feed chute. Once in-feed grabs material, step back from chipper. Do not use force to push materials through.	B3 Medium
3.8	Discharge	Struck by flying debris – sticks, branches, timber Entanglement (amputation/death) Laceration / cuts / bruises / fractures- Serious injury or death	Operation	Follow procedure in operator's manual if blockage occurs.	D4 Extreme	Ensure discharge chute pointed downwards (reduce dust). Clear away discharge regularly. If chipper begins to vibrate or shake violently, stop work immediately and stop machine. Always stop machine, wait for moving parts to stop and lock out	B2 Low

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						power to chipper before removing any blockages. NEVER climb or stand on chipper/in-feed.	
3.9	Faulty/out of order, or poorly maintained plant	Entanglement (amputation/death) Laceration / cuts / bruises / fractures Serious injury or death Muscular stress / Musculoskeletal Disorder	Operation Emergency Maintenance	Operator's manual outlines plant maintenance schedule. Current maintenance inspections up to date as per manufacturers recommendation.	B4 High	Always perform pre-operation inspection before operating the plant. Implement 'tag out' procedure to isolate faulty/out of order plants. Do not use an 'out of order' plant. Record all faults in logbook. Perform plant maintenance as per manufacturer's maintenance schedule. Keep maintenance records / plant logbook up to date.	B1 Low
3.10	Refuelling	Explosion Fire			B4 High	When refuelling: • Keep away from ignition sources; • Do not smoke; • Avoid spilling fuel over hot engine.	A2 Low
3.11	Engine exhaust pipe	Burn	Operation	Exhaust pipe guarded. "Hot surface" decal in place.	C2 Medium	Do not touch exhaust pipe when hot.	A1 Low
3.12	Plant modifications after completion of risk assessment.	Crushing Overturning	Operation Set up		C5 Extreme	Ensure modifications made to the plant are inspected, assessed, and approved by a competent person. Review hazard analysis and risk assessment after plant modifications.	B1 Low

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4	Transport						
4.1	Loading and unloading – driving on	Roll over Crushing	Transport	Operator's manual suggests the use of a loading ramp of less than 15° that is strong and wide enough to take the machine's weight. Use low speed / low engine RPM on slopes / ramps.	C4 Extreme	Follow appropriate loading procedures including using weight rated ramps, have ramps at a low inclination, all person clear from the loading zone and placing the heavy end towards the front of the tray or tow hitch on a trailer.	B2 Low
4.2	Loading and unloading – lifting on	Crush Impact	Transport Lifting	Lifting procedure included in Operator's Manual.	C5 Extreme	Follow appropriate lifting procedure.	B2 Low
4.3	Failure of lifting slings / chains used for lifting or tying down / tie down straps	Roll over Crushing	Transport Lifting	Plant is fitted with designated lifting and tied down points.	C5 Extreme	Use tie-down points provided on the plant to secure it for transportation. Ensure lifting slings and tie down straps are in good condition. Ensure lifting slings have a SWL suited to the load.	B2 Low
5	Plant Failure						
5.1	Power Failure Burst hydraulic hose	Crushing Overturning Burn Skin irritation	Set up Operation Maintenance		A3 Medium	Check hydraulic hose condition during periodic maintenance. Report and "tag out of service" if identified.	A2 Low
5.2	Excessive hydraulic oil pressure.	Impact Crushing	Set up Operation		C3 High	Check pressure settings during preventative maintenance.	A1 Low
5.3	Emergency Stop not available	Crushing Impact Trauma	Emergency Maintenance		C4 Extreme	Check that the emergency stop button functions correctly.	B1 Low
5.4	Inadequate maintenance procedures	Crushing Impact	Maintenance	Maintenance procedures included in Operator's Manual.	C3 High	Allow only qualified service personnel to perform maintenance tasks.	A2 Low

RISK MATRIX							ACTION	HEIRACHY OF CONTROLS
		CONSEQUENCE					**EXTREME –** Do not proceed, until further control measures are implemented to lower the risk. Senior management attention required. **HIGH –** Review and introduce additional controls to lower level of risk. Needs senior management attention. **MEDIUM –** Monitor and maintain supervision and controls. Specify management responsibility. **LOW –** Monitor and manage by routine procedures and monitoring.	1. Elimination – controlling the hazard at the source 2. Substitution – e.g. replacing one substance or activity with a less hazardous one 3. Isolation – e.g. use of barriers to shield or isolate the hazard, enclosures for noisy machinery, installing guards on machinery 4. Engineering – e.g. design and install equipment to counteract the hazard 5. Administration – policies and procedures for safe work practices 6. Personal Protective Equipment – e.g. respirators, ear plugs, face masks, safety glasses, safety shoes
		1. Insignificant	2. Minor	3. Moderate	4. Major	5. Catastrophic		
LIKELIHOOD	**E. Almost Certain** Is expected to occur immediately or within a short timeframe	HIGH	HIGH	EXTREME	EXTREME	EXTREME		
	D. Likely Will probably occur in most circumstances	MEDIUM	HIGH	HIGH	EXTREME	EXTREME		
	C. Possible Could happen and has occurred here or elsewhere	LOW	MEDIUM	HIGH	EXTREME	EXTREME		
	B. Unlikely Unlikely to occur	LOW	LOW	MEDIUM	HIGH	EXTREME		
	A. Rare Not expected to occur	LOW	LOW	MEDIUM	HIGH	HIGH		

CONSEQUENCE DESCRIPTORS			
SEVERITY	**SAFETY**	**ENVIRONMENT**	**BUSINESS**
5. Catastrophic	Potential for incident resulting in serious damage and/or fatality	The aspect is legally or contract regulated and has the potential for a disastrous long term impact resulting in prosecution.	Loss > $1M
4. Major	Potential for incident resulting in serious damage and/or permanent disabling illness or injury	The aspect is legally or contract regulated and has the potential for a serious long term impact resulting in prosecution.	Loss of service provision
3. Moderate	Potential for incident resulting in significant damage and/or temporary disabling illness or injury	Significant environmental aspect with short term impact resulting in improvement notice.	Loss $100K - $1M
2. Minor	Potential for incident resulting in moderate damage and/or requiring medical treatment.	The aspect is legally or contract regulated and has the potential for a moderate reversible short term impact resulting in an improvement notice.	Prolonged reduction in service provision or productivity
1. Insignificant	Potential for incident resulting in minor damage and/or injury requiring first aid treatment	The aspect is not legally or contract regulated and has the potential for a minor negligible impact.	Loss $10K - $100K