Risk Management and Risk Analysis Document	Risk Assessment and Other Considerations	Title: Dozer Overheating Risk Assessment
Identification of Hazards and Risk Assessment		Objectives: Create a product based on the risk assessment of hazards associated with the Dozer Overheating issue and analyze other considerations involved with this issue

	PRE-MITIGATION			POST-MITIGATION		
	Hazards	***Risk Level***	**CONSIDERATIONS**	**MITIGATION(S), WARNINGS AND REMEDIES**	***Risk Level***	***Accept Yes/No***
	MAN					
	Operator Experience Level - Low	High	Less than 100 hours of experience. Considerations put on what type of work done while sitting in the seat (example pushing a road vs. fire line work).	Work with a Dozer Boss.	Moderate	
	Operator Experience Level - Moderate	Moderate	Qualified operator that has meet the Driver Operator Handbook of 100 hours.	The type of conditions, exposure, work required will affect the mitigations actions that are taken.	Moderate	
	Operator Experience Level - High	Low	Has to have Dozer Boss or Tractor Plow to qualify as an IA Dozer operator.	Someone is with operator while working dozer.	Low	
	Cooperative Operator	Moderate	They operate different then us. Some examples are experience and training level.	Put a FS employee with them and maintain communication with them.	Moderate	
	Contracting Operator Known	Moderate	Experience levels and confidence levels of operator.	Have Dozer Boss with them.	Moderate	
	Contacting Operator unknown	High	Experience levels and confidence levels of operator. Have to watch how they operate migrate accordingly.	Have a Dozer Boss with them. Dealing with them accordingly if there are safety issues.	Moderate	
	Fatigue	High	Individual has to not feel pressured to over extend themselves. Supervisors need to make sure work load is balanced with consideration to work/rest regulations. Realize that there is factored time. Individual Responsibility	Ensure quality of rest. Individuals and Supervisors need to manage time and duties.	Moderate	
	Stress	High	Takes your attention away from what you are trying to do. Little bit of stress can effect complicity.	Offer assistance it there is known stress. Use training and communication about different conditions or situations. Try to use more experienced personal in extreme conditions.	Moderate	
	MACHINE					
	Computer System -Limp mode	Extremely High	Watching the different environmental conditions that affect the dozer. Depending on the current setting it can affect how the dozer handles. This can affect how you operate the dozer.	Remove the system/program. Reprogram/Change setting. Operator handling depending on if dozer is overheating. More extreme conditions use more experienced personal. Situational awareness.	High	
	Lack of Communication	High	Metal interference on radio. Environmental factors that affect antenna for example limbs breaking antenna	Magnetic antenna, Use a power mike, head sets, human repeater, cell phones	Moderate	
	Cooling System limp mode	Extremely High	Cleaning of cooling system, operator use/knowledge, environmental factors like ambient temp., confidence in the equipment	Work in tandem, leap frog, Use coordinating/contracting resources, Changing tactics, change out the radiator	High	
	Power Problem – Not enough	Extremely High	The different conditions that can affect the power, the load on the dozer (pushing vs. plowing), more powerful dozer.	Refuse, how far away are any back up resources, Change tactics – direct/indirect, pushing less, plowing less.	High	
	Potential loss of life	Extremely High	Operator experience with overheating, Change tactics – direct/indirect, Tandem/leap frog, Consider safety zones, don't send overheating dozer on a detail	Tandem, leap frog, Change tactics, safety zones (roads, carry the black with you)	High	
	Potential loss of property	High	Operator experience with overheating, Change tactics – direct/indirect, Tandem/leap frog, Consider safety zones, don't send overheating dozer on a detail	Tandem, leap frog, Change tactics, safety zones (roads, carry the black with you)	Moderate	
	2002-2008 J Model	High	Past history of overheating, maintenance record, prior operator history (pool dozer vs. assigned), time of use, weather	Tandem, use back up resources, share knowledge about dozer, situation awareness, experience level of operator	High	
	2009 – Current J Model	High	Past history of overheating, maintenance record, prior operator history (pool dozer vs. assigned), time of use, weather	Tandem, use back up resources, share knowledge about dozer, situation awareness, experience level of operator	High	
	Ambient temperature	Extremely High	Weather, time of use, Operator experience with overheating, Change tactics – direct/indirect, Tandem/leap frog, Consider safety zones, don't send overheating dozer on a detail. Trigger points is when tem is going to be when temps are going above 70 to 80 degrees, when you have to turn off a/c and turn on heater, open windows to try and keep dozer from overheating.	Tandem, use back up resources, share knowledge about dozer, situation awareness, experience level of operator,	Extremely High	
	Cab	Moderate	Blind spots, Brush sweeps (awing), experience level of operator, carry an chainsaw when snagging	Use operators with more seat time, refuse assignment, reinforce sweep	Low	
	Operator Maintenance/ Self Fixes	High	Pool dozer vs. assigned, Knowledge of maintenance, Level of cleaning, walk around to learn about dozer, How does what we do affect the dozer?	Proper training on maintenance, check the dozer daily	Moderate	
	Communication of overheating issues	High	Knowledge of problems not being passed around	Safecomm, safety alert, Risk assessment	Moderate	
	MEDIA **Operational Environment**					
	Terrain	Extremely High	Experience as an Operator in different terrain, Fuel types	Provide training to build experience for operators on different terrain and fuel types and what can happen, provide briefings, Use local knowledge	Moderate	
	Engine - Dust/ debris	High	Open compartments and check dozer on how clean or built up of debris or dust , awareness of the size of gaps where things build up or fill up with	Regularly running maintenance checks, clean more, increase cleaning of belly pan	Low	
	Fuel Type/Fuel Loading	Extremely High	The denser the fuel type the faster the dozer has been overheating, Change tactics Indirect/direct – the pushing and plowing, what kind of resources are available,	Change tactics, Order more resources, work in tandem/leaf frog	High	
	Soil Type	High	Low Ground Pressure (LGP) can be a factor with soil type an example is when plowing you are Lessing the LGP, Operator experience level, order dozers with rear mount winches	Use local knowledge, briefings, training on different soil types, order dozers with rear mounted winches	Moderate	
	Under mining/ sink holes/quacking bogs	Extremely High	Operator experience, local knowledge	Use local knowledge, work with a swamper, testing (easing) with the blade	High	
	Acts of God – Storm/insect/disease	Extremely High	The effect of Storm/insect/disease on fuel loading, Experience level of operators, local knowledge	Increase Situational Awareness, Frequent stops to clean dozer, Different tactics, Use multiple dozers	High	
	Temperature Temp below 70	Extremely High	Higher temp are causing overheating, Operator Experience level, When temperatures are high why are we using those dozers? Trigger points is when temperature below 70 – moderate, 70 to 80 high, Above 80 extremely high Trigger point when you have to turn off a/c and turn on heater, open windows to try and keep dozer from overheating.	Tandem, use back up resources, share knowledge about dozer, situation awareness, experience level of operator, accept or reject	Low	
	Temperature 70 to 80	Extremely High	Higher temp are causing overheating, Operator Experience level, When temperatures are high why are we using those dozers? Trigger points is when temperature below 70 – moderate, 70 to 80 high, Above 80 extremely high Trigger point when you have to turn off a/c and turn on heater, open windows to try and keep dozer from overheating.	Tandem, use back up resources, share knowledge about dozer, situation awareness, experience level of operator, accept or reject	Moderate	
	Temperature Temp above 80	Extremely High	Higher temp are causing overheating, Operator Experience level, When temperatures are high why are we using those dozers? Trigger points is when temperature below 70 – moderate, 70 to 80 high, Above 80 extremely high or another Trigger point when you have to turn off a/c and turn on heater, open windows to try and keep dozer from overheating.	Tandem, use back up resources, share knowledge about dozer, situation awareness, experience level of operator, accept or reject	High	
	MISSION & OPERATIONS					
	Fire Line Construction High	High	Experience level of operator , Use different tactics depending on what kind of conditions are occurring, Follow SOPs	Briefing, Communication from others on the fire, local knowledge, use trigger points, training	Moderate	
	Project Work(trail maintenance, cleaning/clearing for timber markers, clearing hazard trees, erosion work, roads, ponds) when temperature are get 80 degrees	High	Ordinary it is low to moderate depending on the project work, local knowledge	Use local knowledge, briefing, SOPs, training	Low	
	MANAGEMENT & PROCEDURES					
	Equipment purchasing	High	What has been ordered has not been what has been sent, Trying to use equipment that does not fit the job that is needed on the ground level	Communication, Equipment Operators need to be involved in ordering, standardization, Equipment lease	Low	
	Disconnect with all levels on problem with dozer overheating	Extremely High	This issue has been happening since early 2000s and there has been no one stepping up to deal with this, Overheating has been going on so long operators are making do with what they have	Communication, Safenets	High	
	Regional Specs	Extremely High	There are many different conditions that we run dozers in so standardize ordering might cause safety issues, Operators needs are not being considered into standards	Communication, Equipment Operators need to be involved into ordering	High	
Approving Authority:				**Date and Time:**		

Risk Level

VERY HIGH- Magenta
HIGH – Red
MODERATE – Yellow
LOW - Green

Likelihood/Probability

Frequent- Likely to occur often
Probable- Will occur several times
Occasional- Likely to occur sometimes
Remote – Unlikely to occur
Improbable – So unlikely, it can be assumed it not occur

Severity/Consequences

Catastrophic- Results in fatality/fatalities/or loss of economic stability, infrastructure, or relationships.
Critical- Severe injury and/or major damage to local economic stability, infrastructure or relationships.
Marginal - Minor injury and/or minor damage to local economic stability, infrastructure or relationships.
Negligible – Less than minor injury and/or less than minor damage to local economic stability, infrastructure or relationships.