

Company Name:	Equipment/Job Identification: PLANT MAINTENANCE CONVEYOR BELT CHANGE-OUT Type of Equipment: CIRCUIT 1 BELT 2 Make: JEFFREY Model: 24-INCH BELT CONVEYOR Year: 1956 Use: RAW STONE
Mine Name:	
Date of Analysis	

Pre-Assessment

- **List pre-requisites here**

Personal Protective Equipment

Proper Equipment/Tools

General Safety Training

Company Policies

Back Safety and Proper Lifting Procedures

HazCom

New Miner/Experienced Miner Training

Pre-Operational Inspection

Location of Safety Equipment and First Aid Supplies

Fire Extinguishers

Name of First Responders

Names of the Safety Committee

Duty 1: Start of Shift (Pre-plan) Activities

Learner will explain the importance of communicating and exchanging information as part of the start of shift (pre-plan activities). Learner will also explain the job duties, why they are conducted, any associated risk, and how to implement company policies and required regulations. A thorough start of shift activities includes the following job steps:

Job Steps	Importance Narrative (Consider Safety, Production, Maintenance)	Importance Ranking	Satisfactory or Needs Work	Procedures/Risk Resolution/ Notes/Comments
		1=Important 2=Very Important 3=Critical		
Check in (Time Clock)				
Put on work clothes				
<ul style="list-style-type: none"> Steel tip shoes 	To avoid injuries and company policy			Must be minimum 6" boot
Report to lunch room				
Receive job assignment from supervisor				
<ul style="list-style-type: none"> Obtain work order 				Work order number for time card and for charge card Equipment number Work order description Who originated the work order
<ul style="list-style-type: none"> Discuss special instructions as needed 	Efficiency of the job and the safety of the task			
<ul style="list-style-type: none"> Discuss safety issues of job 	Efficiency of the job and the safety of the task and the people involved			
<ul style="list-style-type: none"> Inquire if job area has been cleaned 				
Walk to shop				
<ul style="list-style-type: none"> Watch for traffic 				

Job Steps	Importance Narrative (Consider Safety, Production, Maintenance)	Importance Ranking	Satisfactory or Needs Work	Procedures/Risk Resolution/Notes/Comments
		1=Important 2=Very Important 3=Critical		
<ul style="list-style-type: none"> • Watch for wet/icy surfaces 	Safety concern/could cause personal injury			
Obtain PPE located in shop	Personal protection/company policy			
<ul style="list-style-type: none"> • Get hard hat 	Personal protection from serious injury			
<ul style="list-style-type: none"> • Get hearing protection <ul style="list-style-type: none"> ○ Ear plugs ○ Muffs 				
<ul style="list-style-type: none"> • Get gloves 				
<ul style="list-style-type: none"> • Get respiratory protection 				
<ul style="list-style-type: none"> • Get safety glasses 	Personal protection from serious injury/company policy			
<ul style="list-style-type: none"> • Get safety locks 	Could lead to death/serious injury and equipment damage/company policy			
Receive further job instructions from lead person (Clip process/Vulcanizing process)				
<ul style="list-style-type: none"> • Assign mobile equipment <ul style="list-style-type: none"> ○ Fork lift/gradall ○ Repair truck 				Pre-shift inspections Show Pre-Operational power point presentations
<ul style="list-style-type: none"> • Obtain materials and parts <ul style="list-style-type: none"> ○ Use fork lift to remove conveyor belt (24") from storage area 	Can't perform job			Complete charge out slips Turn charge slips into store house Prefer using fork lift

Job Steps	Importance Narrative (Consider Safety, Production, Maintenance)	Importance Ranking	Satisfactory or Needs Work	Procedures/Risk Resolution/ Notes/Comments
		1=Important 2=Very Important 3=Critical		
○ Get belt clips (190 type clips)				Explain why this size/type of clip is used
○ Get belt tape				

Job Steps	Importance Narrative (Consider Safety, Production, Maintenance)	Importance Ranking	Satisfactory or Needs Work	Procedures/Risk Resolution/Notes/Comments
		1=Important 2=Very Important 3=Critical		
Obtain tools	Without proper tools you can not do the job			<p>Radios – a minimum of three plant radios required,</p> <p>Two belt clamps/blocks, 24-inch, 190 template, Framing square, four come-a-longs, one chain wrench (3-ton), two 5/8-inch x 4 ft. slings, two chains (3/4-inch), two 1/2-inch drive electric impact wrenches, #1 belt punch, #1 nut driver, two stud breaker bars, one 4-1/2 inch electric grinder, face shield, one claw hammer, Two utility knives with a spare blade</p> <p>Combination wrench set, socket set (1/2-inch drive), Light cord with gfci</p> <p>Shaft and bearing assembly</p> <p>Two clevises</p> <p>Two 5/16-inch chains</p> <p>1/2-inch cable (minimum 25 ft.)</p> <p>Six 1/2-inch cable clamps</p> <p>Danger tape, Torch and burning goggles</p> <p>Belt clevises, two 2" x 12" x 36" boards/planks, one spool of 3/4" hemp rope, punch quick connect for impact wrench, and tool bag – each person is responsible for their own tool bag</p>

Job Steps	Importance Narrative (Consider Safety, Production, Maintenance)	Importance Ranking	Satisfactory or Needs Work	Procedures/Risk Resolution/Notes/Comments
		1=Important 2=Very Important 3=Critical		
Call Central Control	Critical to the safety of the work crew/company policy			Review company policy
<ul style="list-style-type: none"> Report names 				
<ul style="list-style-type: none"> Report clock numbers 				
<ul style="list-style-type: none"> Report equipment I. D. being worked on 	Central Control has to be informed			
<ul style="list-style-type: none"> Report what job description 				
<ul style="list-style-type: none"> Have control room place CRT. #1, belt #1 and #2 in the "jog" mode 				
Perform mobile equipment pre-shift inspection	Prevention of serious injury, damage to equipment			
<ul style="list-style-type: none"> Fill out pre-shift inspection check list 				
<ul style="list-style-type: none"> Report or correct any problems 	Serious injury, damage to equipment			
<ul style="list-style-type: none"> Refuel equipment as needed 				Discuss HazCom regulations
Load materials and tools onto truck				
Load belt onto forklift or gradall	Hard to transport to the job			Discuss qualifications to operate equipment
Proceed to job site				
<ul style="list-style-type: none"> Observe speed limit 				
<ul style="list-style-type: none"> Watch for foot traffic 				
<ul style="list-style-type: none"> Watch for equipment right-of-way 	Prevent personal injury			Stay 40 feet from mobile equipment while walking
<ul style="list-style-type: none"> Beware of restricted areas 				

Duty 2: Perform the Job Activities

Learner will demonstrate how to safely perform the job and explain the importance of determining the work to be performed to the trainer. Learner will also explain the job duties, why they are conducted, any associated risk and the results of committing unsafe acts on the job. A thorough performing the job activities includes the following job steps:

Job Steps	Importance Narrative (Consider Safety, Production, Maintenance)	Importance Ranking	Satisfactory or Needs Work	Procedures/Risk Resolution/ Notes/Comments
		1=Important 2=Very Important 3=Critical		
Arrive at job site				
Observe work area upon approach				
Park truck in safe area				
<ul style="list-style-type: none"> Chock wheels 				
Perform work place examination				
Correct or report safety defects	When not corrected or reported could lead to personal injury or damage to equipment			
Verify that crew is at correct belt by visual observation				
Lock equipment out	Could result in loss of life/ Machinery start-up			Each individual applies his/her own locks Review company lock out policy
Apply locks on CRT. #1 Belt #1				
Try to jog belt #1 to make sure belt will not start				
Apply locks on CRT. #1 Belt #2	May lead to injury or loss of life			
Try to jog belt #2 to make sure belt will not start				
Unload tools at tail pulley at Belt #2	Will delay or hamper job			

Job Steps	Importance Narrative (Consider Safety, Production, Maintenance)	Importance Ranking	Satisfactory or Needs Work	Procedures/Risk Resolution/Notes/Comments
		1=Important 2=Very Important 3=Critical		
<ul style="list-style-type: none"> All tools except 3-ton chain wrench and 3/4" chain 				
<ul style="list-style-type: none"> Bring adjustable wrenches 				
Remove wheel chock and drive to head pulley area				
Park truck and chock wheels				
Unload tools at gravity take-up				
Remove the gravity take-up guards	Can't do the job without this step			
Install the chain on beam above the center line of the gravity take-up weight				
Connect 3-ton chain wrench to the chain	Can't do the job without this step			Verify safety latches on hooks Weight limitations in effect
Connect the chain wrench lifting hook into the gravity weight take-up lug				Verify safety latches on hooks
Lift the gravity take-up into the half way position using the 3-ton chain wrench	Position of the take-up is important to the job			Explain this procedure
Close the gravity take-up guards				
Back off tension on belt scrapers				
Remove chocks and drive back to the tail pulley				
Park truck and chock wheels				

Job Steps	Importance Narrative (Consider Safety, Production, Maintenance)	Importance Ranking	Satisfactory or Needs Work	Procedures/Risk Resolution/ Notes/Comments
		1=Important 2=Very Important 3=Critical		
Use fork lift/gradall to put belt in position at tail pulley area for installation				
Install shaft /bearings assembly into the core of the new belt				Verify belt is not hung backwards
Install two 5/16" chains to overhead beams				Minimum 5/16" Watch your loading capacity
Hook one come-a-long to each chain				Close safety latches on hooks
Install one clevis to each bearing				
Connect each come-a-long lifting hook to each clevises				Close safety latches on hooks
Use come-a-long to lift new belt about 6" off floor				
Remove guards from tail pulley area				
Remove skirting from tail chute				
Install a belt clamp at Grimmies bridge				Explain that hemp rope can be used here Do not use rope on incline belts
Remove belt covers if necessary				
Connect two come-a-longs to the belt clamp				Close safety latches on hooks
Install two cables around the next set of idlers				

Job Steps	Importance Narrative (Consider Safety, Production, Maintenance)	Importance Ranking	Satisfactory or Needs Work	Procedures/Risk Resolution/ Notes/Comments
		1=Important 2=Very Important 3=Critical		
Connect come-a-longs into the two cables				Close safety latches on hooks Explain when necessary why chains are used instead of cables
Tension the come-a-longs				
Install the plank underneath the bottom of the top belt				
Set the framing square on the belt top cover and square with the belt above the plank				
Use the utility knife to cut the belt using the framing square as your guide cutting away from your body				
Pull the non-clamped belt end through the tail pulley				
Cut bands on new belt				Stay clear – explain danger of release energy
Pull and feed the new belt end over the tail pulley and through the wall to the old belt end				
Square the new belt end up to the old belt end				
Install planks under both belt ends				
Using the top part of belt clip, mark six sets of holes evenly spaced across belt ends				

Job Steps	Importance Narrative (Consider Safety, Production, Maintenance)	Importance Ranking	Satisfactory or Needs Work	Procedures/Risk Resolution/Notes/Comments
		1=Important 2=Very Important 3=Critical		
Use the electric impact wrench with a #1 punch and quick connector to punch holes into the belt ends				
Install clips through bottom side of belt ends through the punch holes				
Install top of belt clips and nuts				
Tighten each nut using the impact wrench and nut driver				Make sure clip ends are countersunk in top cover of belt ends
Use breaker bars to break studs from all six clips				
Remove come-a-longs, belt clamp, planks and both cables				
Install belt clevis on old return end of belt using 1/2" bolts				Holes must be punched prior to attaching the clevis
Tighten bolts on belt clevis				
Install one end of the 25' cable through the belt clevis cable				
Use three 1/2" cable clamps to fasten a loop around the belt clevis cable				Explain properly installed clamps
Danger tape all affected areas				
Contact pay loader operator using plant radio				
Make a loop in the cable fastening with three 1/2" cable clamps				Reinforce cable clamps proper installation/configuration
Connect the loop of the cable to pay loader's hitch pin				

Job Steps	Importance Narrative (Consider Safety, Production, Maintenance)	Importance Ranking	Satisfactory or Needs Work	Procedures/Risk Resolution/Notes/Comments
		1=Important 2=Very Important 3=Critical		
All personnel must remove locks from Belt #2				
Verify that radios are working properly				
Spot personnel to the proper location all with radio using Channel 3				Still need to have people (possibly more people) to communicate without radios
<ul style="list-style-type: none"> • Assign one to tail pulley 				
<ul style="list-style-type: none"> • Assign one head pulley 				
<ul style="list-style-type: none"> • Assign one with splice 				
<ul style="list-style-type: none"> • Assign one outside with pay loader 				
Verify communication with each person	If you don't communicate, serious injury could occur			
Put the disconnect switch into "On" position				Stand to the side of the disconnect switch throwing switch while facing away from it
Verify that safety lanyard is operating by using "jog"				Explain safety switch procedure
Reset safety lanyard				
Call to make sure that all personnel are clear and ready to pull belt	If you don't communicate, serious injury could occur			Explain the procedure of removing old belt
Begin "pulling" belt using radio communication between "jogging" and "pulling" with a pay loader				
Continue the "pulling" process until the new belt is all the way around				

Job Steps	Importance Narrative (Consider Safety, Production, Maintenance)	Importance Ranking	Satisfactory or Needs Work	Procedures/Risk Resolution/ Notes/Comments
		1=Important 2=Very Important 3=Critical		
Lock #2 belt out	Prevent injuries Inadvertent starting			All personnel install their locks
Disconnect the cable from the pay loader's hitch pin				
Release pay loader operator				
Disconnect cable and belt clevis from belt				
Place cable and belt clevis on truck				
Cut the old belt from new belt				
Feed new belt through tail pulley to the other end of new belt				
Install one belt clamp on each end of belt				Explain this procedure on distances between belt clamps
Install come-a-longs to belt clamps				Close safety latches on hooks
Use come-a-longs to remove belt slack				
Place plank under the top belt				
Square belt ends				Explain this procedure
Nail one end of belt to the plank				
Install splicing template				Explain this procedure
Install holes in belt through template				Explain this procedure
Remove template from belt				
Put clips into one end of belt				Follow manufacturer's procedures

Job Steps	Importance Narrative (Consider Safety, Production, Maintenance)	Importance Ranking	Satisfactory or Needs Work	Procedures/Risk Resolution/Notes/Comments
		1=Important 2=Very Important 3=Critical		
Turn template upside down, slide onto bolts of clips to line up with holes				
Take other end of belt and install clips through holes				
Install top half of clips with nuts (hand tight)				
Install belt tape to seal the joint				
Ensure splice is square				
Tighten all nuts on clips with impact wrench				Explain this procedure
Use breaker bars to break off all clip bolts				
Grind the clips with a 4 1/2" disc grinder				Must wear full face shield Grind bolts flush with the nuts
Remove nail from belt				
Remove planks from belt				
Remove the belt blocks and come-a-longs				
Install skirting and guards on tail pulley	Job not done until all of the guards are on, could cause serious injury			
Reinstall all belt covers				
Go to drive end of belt and lower gravity take-up				
Remove chains and chain wrench				
Install guards at gravity take-up	Job not done until all of the guards are on, could cause serious injury			
Re-tension belt scrapers				Explain this procedure

Job Steps	Importance Narrative (Consider Safety, Production, Maintenance)	Importance Ranking	Satisfactory or Needs Work	Procedures/Risk Resolution/ Notes/Comments
		1=Important 2=Very Important 3=Critical		
Remove all locks				Belt #1 Belt #2
Put disconnect switch to the “On” position				Stand to the side of the disconnect switch throwing switch while facing away from it
“Jog” and “train” belt				
Check and replace all bad idlers, as needed				Lock belt out before any idler replacement is started
Release system to Central Control				

Duty 3: Clean-Up Activities

Learner will demonstrate how to conduct a safe and thorough clean-up procedure of the job. Learner will also explain the job duties, why they are conducted, any associated risk, and how to implement appropriate controls. A thorough clean-up activity procedure includes the following job steps:

Job Steps	Importance Narrative (Consider Safety, Production, Maintenance)	Importance Ranking	Satisfactory or Needs Work	Procedures/Risk Resolution/Notes/Comments
		1=Important 2=Very Important 3=Critical		
Gather all tools up and load them on the truck				
<ul style="list-style-type: none"> If torches were used, gases must be bled 	Eliminate fire and burn hazards			Show video
<ul style="list-style-type: none"> Before moving truck, ensure chocks are removed 				
Pick up all debris				
Clean up old belt				
<ul style="list-style-type: none"> Roll up and move with gradall/forklift 				
Clean up, remove new belt on roll and return to belt storage location				
Remove danger tape				
Perform workplace inspection				
<ul style="list-style-type: none"> Correct any deficiencies 	Could lead to injuries or loss of production			
Ensure all locks are off				
<ul style="list-style-type: none"> Ensure all disconnects/lanyards have been place in the "on" position 				
Call Central Control				
<ul style="list-style-type: none"> Report names 				
<ul style="list-style-type: none"> Report numbers 				

Job Steps	Importance Narrative (Consider Safety, Production, Maintenance)	Importance Ranking	Satisfactory or Needs Work	Procedures/Risk Resolution/Notes/Comments
		1=Important 2=Very Important 3=Critical		
<ul style="list-style-type: none"> Report equipment I.D. 				
<ul style="list-style-type: none"> Verify "ready" light 				
Return to shop				
Park truck in front of shop				
Chock truck wheels				
Remove debris from truck and place into proper containers				
Unload tools/equipment from truck				
Visual inspection of your tools				
<ul style="list-style-type: none"> Replace/repair damaged tools 				
Store tools in proper location				
Remove chocks from wheels				
Drive truck to wash rack				
Clean truck				
<ul style="list-style-type: none"> Blow off/high pressure wash 				
Drive truck back to shop				
Chock wheels				
Ensure personal and company tool boxes are locked				

Duty 4: End of Shift Activities

Learner will explain importance of communicating and exchanging information as part of the work to be accomplished in completing the end of shift activities. Learner will also explain the job duties, why they are conducted, any associated risk, and how to implement appropriate controls. A thorough end of shift activities includes the following job steps:

Job Steps	Importance Narrative (Consider Safety, Production, Maintenance)	Importance Ranking	Satisfactory or Needs Work	Procedures/Risk Resolution/ Notes/Comments
		1=Important 2=Very Important 3=Critical		
Ensure that all parts have been charged out and slips turned in				
Fill out work order and explain the work performed				
Fill out time card				
Place all paperwork into box in front of shop				
Notify supervisor of job completion				
Root cause analysis meeting				
<ul style="list-style-type: none"> • Hold job critique meeting <ul style="list-style-type: none"> ○ Improve job efficiency ○ Improve job safety 				
<ul style="list-style-type: none"> • Abnormal conditions dictate discussion 				
Shower up				
Check out (time clock)				

