Basic Characterization

Foundry
Sand Mold

- 4 m x 7.2 m area
- 2 workers 8 hours/day (0500 – 1300)
- PPE
  - Ear plugs
  - Gloves
  - Safety glasses
Sand Mold

- Process description
  - Sand drops from upper hopper into cope and drag
  - The sand is then pressed
  - After pressing, the cope and drag is then cleaned by compressed air
  - The cope and drag is then placed on a track for transport
Sand Mold

• Other process notes
  – No LEV
  – One floor fan is operating in the area
  – The worker sweeps the floor occasionally
Shell Core

- 10.3 m x 6.7 m area
- 3 workers 8 hours/day (0500 – 1300 and 0000 – 0800)
- PPE
  - Ear plugs
  - Gloves
  - Safety glasses
Shell Core

• Process description
  – Sand containing phenolic resin is placed into a mold
  – The filled mold is heated to set the resin
  – The shell core is removed from the mold
  – The worker then files the shell core as needed
Shell Core

• Other process notes
  – Three shell core machines
  – LEV on each machine with low velocity (< 0.2 m/s)
  – Two floors fans operating
  – Worker also changed or repaired the molds, as needed
Oil Core

- 6 m x 5 m area
- One worker 8 hours/day (0500 – 1300)
- PPE
  - Gloves
  - Safety glasses
Oil Core

• Process description
  – Molds are filled with sand and an oil and catalyst mix using a gravity fed Simple Advantage Core (SAC) machine
  – The molds set for about 1 minute
  – The mold is removed and the castings are sanded to remove rough spots
Oil Core

- Other process notes
  - Drums containing catalyst are replaced twice per year
  - LEV present
  - One SAC machine
Shake-out (Front End)

- 3 m x 7.1 m area
- 3 workers 8 hours/day (0500 – 1300)
- PPE
  - Airline facepiece (airline not connected)
  - Ear plugs
  - Safety shoes
  - Safety glasses
  - Leather gloves
Shake-out (Front End)

- Process description
  - The cope and drag from sand mold is moved to the shaker
  - The shaker removes sand and parts from the cope and drag
  - Sand is collected
  - Parts are sent to Back End Shake-out on a conveyor
Shake-out (Back End)

- 2 m x 7.1 m area
- 1 worker 8 hours/day (0500 – 1300)
- PPE
  - Ear plugs
  - Glasses
  - Safety shoes
  - Leather gloves
  - 3M 8511 N95 dust mask
Shake-out (Back End)

• Process description
  – The parts arrive from Shake-out (Front End)
  – The parts are further separated by picking them up and dropping them onto a table
  – Once separated, the parts are placed into bins
Shake-out (Back End)

- Other process notes
  - No LEV
  - This task occurs intermittently through the 8 hour shift
    - The worker may also work in a casting area or drives a forklift
Grinding

- 10 m x 15 m area
- 2 workers 8 hours/day (0500 – 1300)
  - Grinding wheel operation
- 3 workers 8 hours/day
  - Bench/angle grinding operation
Grinding

- PPE (grinding wheel operation)
  - Airline respirator
  - Ear plugs
- PPE (bench/angle grinding operation)
  - Airline respirator
  - Ear plugs
  - Safety shoes
  - Leather gloves
Grinding

• Process description (grinding wheel)
  – A part is grabbed from the supply bin
  – The part is deburred using a grinding wheel
  – The part is then tossed into a collection bin for inspection
  – After inspection, the parts are sorted into separate part bins
Grinding

• Process description (bench/angle grinding)
  – Larger parts are deburred using power tools (dremel tools, angle grinders, etc.)
  – Heavy parts are moved by hoise

• Other process notes
  – No LEV