



- MISCELLANEOUS ABBREVIATIONS**
- APED - ATOMIC POWER EQUIPM. DEPT. OF O.E. CO.
 - N - MEETS APED REQ'TS FOR NUCLEAR SERVICE
 - CRW - EQUIPMENT CLOSED RADWASTE
 - ORW - FLOOR (OPEN) RADWASTE
 - AW - ACID WASTE (CORROSIVE, CAUSTIC)
 - NW - NORMAL WASTE (CONVENTIONAL)
 - OW - OILY WATER WASTE
 - SW - SANITARY WASTE
 - LO - LOCKED OPEN
 - LC - LOCKED CLOSED
 - AL - AIR LOCK
 - SP - SET POINT (CONTROL)
 - PPS - PLANT PROTECTION SYSTEM
 - D - INDICATES DOUBLE PACKED STEM
 - NC - NORMALLY CLOSED
 - NO - NORMALLY OPEN
 - NE - NORMALLY ENERGIZED
 - ND - NORMALLY DE-ENERGIZED
 - CRD - CONTROL ROD DRIVE
 - CRDHS - CONTROL ROD DRIVE HYDRAULIC SYSTEM
 - HCU - HYDRAULIC CONTROL UNIT
 - RBCW - REACTOR BUILDING CLOSED COOLING WATER SYSTEM
 - TBCW - TURBINE BUILDING CLOSED COOLING WATER SYSTEM
 - HPCI - HIGH PRESSURE COOLANT INJECTION
 - RHR - RESIDUAL HEAT REMOVAL
 - RCIC - REACTOR CORE ISOLATION COOLING
 - LT - LOCKED THROTTLED
 - NT - NORMALLY THROTTLED
 - FAI - FAILS AS IS
 - FO - FAILS OPEN
 - FC - FAILS CLOSED
 - LN - LOCKED IN NEUTRAL

- PIPING AND INSTRUMENT DIAGRAMS**
- BECH-M100 P.I.D. PIPING SYMBOLS
 - BECH-M101 P.I.D. INSTRUMENT SYMBOLS
 - BECH-M102 P.I.D. INSTRUMENT IDENTIFICATIONS
 - BECH-M103(1) P.I.D. MAIN STEAM, TURBINE STOP AND CONTROL VALVES
 - BECH-M103(2) P.I.D. MAIN STEAM, HIGH AND LOW PRESSURE TURBINES
 - BECH-M103(3) P.I.D. MAIN STEAM, MOISTURE SEPARATOR & REHEATERS
 - BECH-M104(1) P.I.D. TURBINE STEAM SEALS
 - BECH-M104(2) P.I.D. FEEDWATER HEATERS IE003A, 4A, 5A AND 6A
 - BECH-M104(3) P.I.D. FEEDWATER HEATERS IE001A, 2A AND MAIN CONDENSER IE007A
 - BECH-M105(1) P.I.D. STEAM AIR EJECTOR
 - BECH-M105(2) P.I.D. FEEDWATER HEATERS IE001B, 2B AND MAIN CONDENSER IE007B
 - BECH-M105(3) P.I.D. FEEDWATER HEATERS IE003B, 4B, 5B AND 6B
 - BECH-M106 P.I.D. COND./FEEDWATER
 - BECH-M107 P.I.D. COND./FEEDWATER
 - BECH-M108 P.I.D. COND./DEMIN SYSTEM
 - BECH-M109 P.I.D. COND./DEMIN SYSTEM
 - BECH-M110 P.I.D. MAKEUP DEMINERALIZER SYSTEM
 - BECH-M111 P.I.D. GENERAL SERVICE WATER SYSTEM
 - BECH-M112 P.I.D. REACTOR BLDG. COOL. WATER SYSTEM
 - BECH-M113 P.I.D. RHR SERVICE WATER AND EMERG. SERVICE WATER
 - BECH-M114 P.I.D. NUCLEAR BOILER SYSTEM
 - BECH-M115 P.I.D. REACTOR VESSEL INSTRUMENTATION
 - BECH-M116 P.I.D. REACTOR RECIRCULATION SYSTEM
 - BECH-M117 P.I.D. CONTROL ROD DRIVE HYDRAULIC SYSTEM
 - BECH-M118 P.I.D. CONTROL ROD DRIVE HYDRAULIC SYSTEM
 - BECH-M119 P.I.D. RESIDUAL HEAT REMOVAL SYSTEM
 - BECH-M120 P.I.D. RESIDUAL HEAT REMOVAL SYSTEM
 - BECH-M121 P.I.D. CORE SPRAY SYSTEM
 - BECH-M122 P.I.D. HPCI SYSTEM STEAM SIDE
 - BECH-M123 P.I.D. HPCI SYSTEM WATER SIDE
 - BECH-M124 P.I.D. RCIC SYSTEM STEAM SIDE
 - BECH-M125 P.I.D. RCIC SYSTEM WATER SIDE
 - BECH-M126 P.I.D. STANDBY LIQUID CONTROL SYSTEM
 - BECH-M127 P.I.D. REACTOR WATER CLEANUP SYSTEM
 - BECH-M128 P.I.D. REACTOR WATER FILTER DEMIN
 - BECH-M129 P.I.D. RIVER WATER SUPPLY INTAKE STRUCTURE
 - BECH-M130(01) P.I.D. INSTRUMENT AND SERVICE AIR COMPRESSORS IK090A, B AND C COOLING SYSTEM
 - BECH-M130(02) P.I.D. INSTRUMENT AND SERVICE AIR COMPRESSORS IK090A, B AND C
 - BECH-M130(03) P.I.D. INSTRUMENT AND SERVICE AIR COMPRESSORS IK090A, B AND C
 - BECH-M130(04) P.I.D. INSTRUMENT AIR DRYERS, TURBINE BLDG. BASEMENT
 - BECH-M130(05) P.I.D. INSTRUMENT AIR SYSTEM, TURBINE BLDG. AND OFFGAS AREAS
 - BECH-M130(06) P.I.D. INSTRUMENT AIR SYSTEM, TURBINE BLDG. HEATER BAY AREA, PUMP HOUSE AREA
 - BECH-M130(07) P.I.D. INSTRUMENT AIR SYSTEM, REACTOR BLDG. TORUS ROOM, RADWASTE BLDG. HPCI, RCIC AREAS
 - BECH-M130(08) P.I.D. INSTRUMENT AIR SYSTEM, REACTOR BLDG. REFUEL FLOOR HVAC CONTROLS, KAMANS
 - BECH-M130(09) P.I.D. SERVICE AIR SYSTEM
 - BECH-M130(10) P.I.D. BREATHING AIR COMPRESSORS IK028A, B AND SUPPLY
 - BECH-M131 P.I.D. TURBINE LUBE OIL SYSTEM
 - BECH-M132(1) P.I.D. DIESEL GENERATOR SYSTEM
 - BECH-M132(2) P.I.D. I0031 STANDBY DIESEL GENERATOR
 - BECH-M132(3) P.I.D. I0021 STANDBY DIESEL GENERATOR
 - BECH-M133(1) P.I.D. FIRE PROTECTION
 - BECH-M133(2) P.I.D. FIRE PROTECTION
 - BECH-M133(3) P.I.D. FIRE PROTECTION HOSE STATIONS
 - BECH-M133(4) P.I.D. FIRE PROTECTION DELUGE SYSTEMS
 - BECH-M133(5) P.I.D. FIRE PROTECTION SPRINKLER SYSTEMS
 - BECH-M134 P.I.D. FUEL POOL COOLING AND CLEANUP SYSTEM
 - BECH-M135 P.I.D. FUEL POOL FILTER DEMIN. SYSTEM
 - BECH-M136 P.I.D. SERVICE CONDENSATE SYSTEM
 - BECH-M137(1) P.I.D. RADWASTE SUMP SYSTEM
 - BECH-M137(2) P.I.D. RADWASTE SUMP SYSTEM
 - BECH-M138(1) P.I.D. EQUIPMENT RADWASTE SYSTEM (CLOSED)
 - BECH-M138(2) P.I.D. EQUIPMENT RADWASTE SYSTEM (CLOSED)
 - BECH-M139 P.I.D. FLOOR DRAIN RADWASTE SYSTEM, OPEN
 - BECH-M140 P.I.D. RADWASTE SOLIDS HANDLE SYSTEM
 - BECH-M141 P.I.D. OFF GAS SYSTEM
 - BECH-M142 P.I.D. CIRCULATING WATER SYSTEM
 - BECH-M143(1) P.I.D. CONTAINMENT ATMOSPHERE CONTROL SYSTEM
 - BECH-M143(2) P.I.D. CONTAINMENT ATMOSPHERE CONTROL SYSTEM
 - BECH-M143(3) P.I.D. CONTAINMENT ATMOSPHERE CONTROL SYSTEM
 - BECH-M143(4) P.I.D. CONTAINMENT ATMOSPHERE CONTROL SYSTEM
 - BECH-M144(1) P.I.D. COOLING WATER SYSTEM
 - BECH-M144(2) P.I.D. COOLING WATER SYSTEM
 - BECH-M145(1) P.I.D. ELECTRO HYDRAULIC FLUID POWER UNIT
 - BECH-M145(2) P.I.D. STATOR WINDING COOLING WATER SYSTEM
 - BECH-M145(3) P.I.D. GAS CONTROL PIPING SYSTEM
 - BECH-M145(4) P.I.D. HYDROGEN SEAL OIL SUPPLY SYSTEM
 - BECH-M146 P.I.D. SERVICE WATER SYSTEM PUMPHOUSE
 - BECH-M147 P.I.D. TURBINE BUILDING SAMPLE SYSTEM
 - BECH-M148 P.I.D. AREA RADIATION MONITOR SYSTEM
 - BECH-M149 P.I.D. OFFGAS RECOMBINER
 - BECH-M150 P.I.D. PLANT AIR FLOW DIAGRAM
 - BECH-M151 P.I.D. CONTROL BLDG. AND TSC AIR FLOW DIAGRAM
 - BECH-M152 P.I.D. REACTOR BLDG. AIR FLOW DIAGRAM
 - BECH-M153 P.I.D. TURBINE BLDG. AIR FLOW DIAGRAM
 - BECH-M154 P.I.D. HVAC RADWASTE BLDG. AIR FLOW DIAGRAM
 - BECH-M155 P.I.D. ADMIN. BLDG. AIR FLOW DIAGRAM
 - BECH-M156 P.I.D. DRYWELL AIR FLOW DIAGRAM
 - BECH-M157(1) P.I.D. DRYWELL COOLING WATER SYSTEM
 - BECH-M157(2) P.I.D. DRYWELL COOLING WATER SYSTEM
 - BECH-M158 P.I.D. HVAC AIR FLOW DIAGRAM STANDBY GAS TREATMENT SYSTEM
 - BECH-M159 P.I.D. VENT SYSTEM TURBINE BLDG.
 - BECH-M160(1) P.I.D. AUXILIARY HEATING SYSTEM MAIN LOOP
 - BECH-M160(2) P.I.D. AUXILIARY HEATING SYSTEM BOILER
 - BECH-M161 P.I.D. AIR CONDITIONING SYSTEM CONTROL BLDG.
 - BECH-M162 P.I.D. AUXILIARY HEATING SYS. REACTOR BLDG.
 - BECH-M163 P.I.D. AUXILIARY HEATING SYS. TURBINE BLDG.
 - BECH-M164 P.I.D. VENT SYSTEM RADWASTE BLDG.
 - BECH-M165 P.I.D. MAIN PLANT AIR INTAKE AND MG ROOM
 - BECH-M166 P.I.D. COOLING AND HEATING SYSTEM PLANT AIR SUPPLY
 - BECH-M167 P.I.D. ADMIN. BLDG. HEATING AND COOLING SYSTEM
 - BECH-M168 P.I.D. ADMIN. BLDG. HEATING AND COOLING SYSTEM
 - BECH-M169(1) P.I.D. CONTROL BLDG. HEATING SYSTEM
 - BECH-M169(2) P.I.D. CONTROL BLDG. COOLING-CHILLED WATER SYSTEM
 - BECH-M169(3) P.I.D. CONTROL BLDG. CHILLERS IVCH001A AND IVCH001B
 - BECH-M170 P.I.D. HVAC MISC. CONTROL SYSTEM
 - BECH-M171 P.I.D. REACTOR BLDG. HVAC COOLING SYSTEM
 - BECH-M172 P.I.D. AIR FLOW DIAGRAM HEATING AND COOLING SYSTEM MACHINE SHOP/OFFGAS RETENTION BLDG.
 - BECH-M173 P.I.D. AIR FLOW DIAGRAM STANDBY FILTER
 - BECH-M174 P.I.D. DRYWELL HVAC FAN SYSTEM
 - BECH-M175 P.I.D. AIR FLOW DIAGRAM PUMPHOUSE
 - BECH-M176(1) P.I.D. REACTOR BLDG. EXHAUST PLENUM AND OFFGAS STACK
 - BECH-M176(2) P.I.D. REACTOR BLDG. VENTILATION SYSTEM
 - BECH-M177 P.I.D. INTAKE STRUCTURE AND TSC CONTROL DIAGRAM
 - BECH-M179 P.I.D. HVAC SYMBOLS AND ABBREVIATION
 - BECH-M180 P.I.D. CHLORINATION AND ACID FEED SYSTEM
 - BECH-M181 P.I.D. CONTAINMENT ATMOSPHERE MONITOR SYSTEM
 - BECH-M182 P.I.D. RADWASTE EVAPORATOR SYSTEM
 - BECH-M183 P.I.D. RADWASTE SAMPLE SYSTEM
 - BECH-M184 P.I.D. MAIN STEAM ISOLATION VALVE LEAK CONTROL MSIV
 - BECH-M185 P.I.D. CARDOX SYSTEM
 - BECH-M186 P.I.D. RADWASTE AND STORAGE HANDLING SYSTEM
 - BECH-M187 P.I.D. POST ACCIDENT SAMPLING SYSTEM
 - BECH-M188(1) P.I.D. LOW LEVEL RADWASTE HVAC SYSTEM
 - BECH-M188(2) P.I.D. LOW LEVEL RADWASTE HVAC SYSTEM
 - BECH-M188(3) P.I.D. AIR FLOW DIAGRAM LLRPSF
 - BECH-M188(4) P.I.D. AIR FLOW DIAGRAM LLRPSF
 - BECH-M189(1) P.I.D. HYDROGEN WATER CHEMISTRY SYSTEM
 - BECH-M189(2) P.I.D. HYDROGEN WATER CHEMISTRY SYSTEM-GAYS
 - BECH-M189(3) P.I.D. ZINC INJECTION SYSTEM

- NOTES:**
- THE SYMBOLS SHOWN HERE ARE FOR USE WITH P.I.D.'S BECH-M100 THROUGH M149 & M150 THROUGH M189 ONLY. REFER TO BECH-M175 FOR SYMBOLS AND ABBREVIATIONS USED ON THE HVAC P.I.D.'S M150 THROUGH M178.
 - FOR MECH., ELECT. AND HVAC DWGS. OF THE DATA ACQUISITION CENTER SEE VENDOR PRINTS AND P-001 SERIES.
 - SEISMIC ADEQUATE FLAG INCORPORATED PER DCP-1554.
 - PIPING STRUCTURAL RESTRAINTS OUTSIDE THIS SEISMIC CLASS I BREAK MAY BE PART OF THE SEISMIC CLASS I STRUCTURAL BOUNDARY.
 - MANUAL VALVES IN PROCESS AUXILIARY LINES (SECONDARY LINES) CAN BE SHOWN USING THE GATE VALVE SYMBOL UNLESS THE VALVE TYPE IS IMPORTANT TO THE PROCESS.

D-002

6/23/98	REVISED PER DDC-3639	DA	TAK	RLB	TWS	
3/11/98	REVISED PER DDC-3515	DA	JAH	TWS	GH	
2/13/97	REVISED & REDRAWN PER DDC-3245	MS	TAK	TP	DE	
10/26/95	REVISED PER DCP-1554	MS	TAK	TH	CEZ	
6/14/88	REVISED PER DDC-3940	JAH	TAK	SD	TWS	
7/8/98	REVISED PER DDC-3647	JAH	TAK	SD	RLB	
NO.	DATE	REVISION	DESIGN	CHKD	ENGR	WR
BECHTEL SAN FRANCISCO						
DUANE ARNOLD ENERGY CENTER-UNIT NO 1 IOWA ELECTRIC LIGHT AND POWER COMPANY CEDAR RAPIDS, IOWA						
P.&I.D. PIPING SYMBOLS						
DRAWING NO.					REV.	
BECH-M100					24	