Appendix A: HAP Assessment Information Needs

General:

* Plant General Information and Data
* General plant history
* Location/coordinates
* Maintenance/upgrade history, major events/failures
* Previous assessment reports
* Upgrade plans/studies
* Cost and benefit information for upgrade projects
* License/Constraint information
* Equipment specifications (original and upgraded)
* Turbine specifications: nameplate info, speed ring/shaft/runner design, materials/alloys
* Governor specifications: nameplate info, design info
* Generator specifications: nameplate, design info
* Transformer and switchgear specifications: nameplate, design info
* Vibration monitoring specifications
* Drawings
* General: Site arrangement, general layout/elevation drawings
* Civil: Outline of water conveyances (intake, trash racks, tunnel/penstock/open channel, penstock valves, scroll/spiral case, draft tube, tailrace)
* Civil: dam, spillway, sluice/outlet, powerhouse, intake concrete sections
* Mechanical: trashrack, turbine equipment, balance of plant, raw water piping drawings and flow diagrams
* Mechanical: governing system
* Instrumentation and Controls (I&C): process and instrumentation diagrams for units
* Electrical: single line for generators/exciters/transformers/switchgear

Condition Assessment Data

* Inspection/Test Reports/Results
* Summary of scheduled/routine inspection program
* Leakage and seepage observations and data from spillway gates, dams, and reservoir
* Corrosion, blockage, other damage to conveyances
* Conveyance head loss measurements/observations
* Cavitation inspection and measurement data
* Visual, remote operated vehicle (ROV), dewatered, or diving inspection results
* Seal ring inspection data (gap widths)
* Water or oil leakage inspection & measurement data
* Bearing lube oil analysis results
* Generator field test data
* History of any significant generator faults/repairs/upgrades in stator or rotor
* Transformer test data including factory and field tests.
* Transformer Oil Quality and dissolved gas test reports
* I&C, Condition Monitoring, and Decision Support Systems Info
* Control narrative
* Input / Output (I/O) list
* Network diagram
* Condition monitoring overview, trending, maintenance
* Hardware and software systems vendors

Performance Assessment Data

* Unit and Plant Performance Data and Information
* Turbine characteristic curves (original and current)
  + Model test data
  + Field test data
* Generator efficiency curves
* Hourly (sub-hourly, if available) operational data for multiple years
  + total plant releases including spill/sluice/bypass values vs. time
  + Head water level, tail water level, unit power, unit flow vs. time
  + Wicket gate and blade (Kaplan) position vs. time
  + Trash rack hydraulic head differential vs. time (if available)
  + Air flow rates and air on or off for aerating units
* Air effects on unit efficiency for aerating units
* Environmental constraints
* Unit operating constraints (minimum flow, cavitation and vibration constraints, generator constraints)
* Generator capability curves
* Generator excitation curves
* Generating Availability Data System (GADS) Report
* Unit operating hours and number of starts
* Dispatch requests