Copper Canyon Dam: RCA example data set (chat version)

> **Disclaimer.** This data set is part of the IT/OT Academy, offered by The IT/OT Insider. Everything in it (the dam, the company, the turbine supplier, the people, the data) is **fictional and generated**, made **only for demo and training purposes**. Do not use it for any real control, quality or maintenance decision.

Try an AI-assisted **root cause analysis (RCA)** on a hydro turbine in a normal AI chat app (Claude or ChatGPT). No installation, no coding, no prior experience needed. You upload six files, paste one prompt, and the AI works as a co-analyst: it reads the documents and the sensor data, tests possible causes against the evidence, and writes a first draft RCA report.

This is the simplified version of the full demo. The full version (a complete document library and historian with 1-second data, for Claude Code, Codex or Copilot agent mode):

- Project: https://github.com/itotinsider/cromley-hydraulics-uns
- RCA guide for engineers: https://github.com/itotinsider/cromley-hydraulics-uns/wiki/RCA-guide-for-engineers

The story in 30 seconds

Copper Canyon Dam has three generating units with turbines from the (fictional) supplier Cromley Hydraulics. On **3 November 2026 at 09:00** the supplier's monitoring PLC on **Unit 1** (serial `CH-FR-1987-0042`) raised a *high-high* alarm on **pad 3 of the turbine guide bearing (TGB)**. The shift unloaded and stopped the unit, following procedure OP-07.

Your job: find out **why**. Was the bearing really overheating, or was it the measurement? What caused it, and what should be done so it does not happen again?

Step 1: Unzip the folder

Unzip the download and open the folder. You will see:

```
Copper Canyon Dam RCA Example Data Set (chat version)/
├── README.md                    ← this file
├── upload/                      ← the 6 files you upload to the chat
│   ├── 1_instructions.md        ← instructions for the AI (role, rules, RCA procedure, report template)
│   ├── 2_documents.md           ← supplier manual, schematics, service bulletin, procedures, earlier RCAs
│   ├── 3_records.md             ← asset register, FMECA, PM plan, MOC register, work orders, oil lab, shift log
│   ├── 4_alarms_and_events.csv  ← alarm log and SCADA event journal
│   ├── 5_trend_3weeks.csv       ← sensor data, 3 weeks, 4-hour averages
│   └── 6_event_window.csv       ← sensor data around the event, 10-minute averages
└── upload-as-one-file/
    └── copper-canyon-rca_all-in-one.md   ← the same 6 files in one file (backup option)
```

Together the files are about 220 KB, roughly 65,000 tokens.

Step 2: Open a chat app

App	Works?	Tips
Claude (claude.ai, desktop or mobile app)	Yes, recommended	A paid plan (Pro or higher) gives the most room. Use the most capable model and switch on **extended thinking**. If you see the setting *Code execution and file creation*, switch it on: Claude can then compute on the CSV files and give you the report as a file.
ChatGPT (chatgpt.com or app)	Yes	A paid plan (Plus or higher) is recommended. Choose a **reasoning / Thinking** model. ChatGPT reads the CSV files with its built-in data analysis.
Microsoft Copilot, Google Gemini, others	Try it	Upload the six files, or the single all-in-one file if the app accepts fewer files. Results vary more.

Free plans may limit uploads or message length. If an upload of six files is refused, use the single file in `upload-as-one-file/`.

Tip: in Claude and ChatGPT you can also create a **Project**, add the six files to the project's files or knowledge, and start chats inside it. Then you only upload once.

Step 3: Upload and paste the prompt

1. Start a **new chat**.
2. Upload **all six files** from the `upload/` folder (drag them into the chat window, or use the paperclip / + button). Wait until all six show as uploaded.
3. Copy the prompt below **exactly**, paste it into the chat and press Enter.

The RCA prompt

```
Read 1_instructions.md and follow it exactly; it tells you how to use the other files. Then start the Copper Canyon Dam RCA process for Unit 1 (CH-FR-1987-0042): CH PLC alarm TGB pad 3 high-high at 3 Nov 2026 09:00, unit unloaded and stopped by the shift per OP-07.
```

What to expect (roughly 2–10 minutes): the AI follows the site's RCA procedure. It lists possible causes from the failure-mode table (FMECA), checks each one against the documents and the sensor data, and writes a draft report `RCA-2026-DRAFT` in the site's template: problem, timeline, hypotheses (verified, ruled out or open), physical / human / latent root causes, and actions. At the end it gives a short summary with the top three actions and the open questions for the team.

Optional warm-up prompt (before the RCA prompt)

If you want to see first what the AI has to work with:

```
Read 1_instructions.md and the other uploaded files. Tell me what documents and data you
have, which units and period the data covers, and what you think is missing for an RCA.
```

Step 4: Read it like an engineer

- **The AI is a co-analyst, not the final judge.** Every claim in the report should point to evidence: a work order number, an oil sample ID, a shift log time, a document section, or a data file with a column and time window. Check a few of them yourself in the files.
- Anything without evidence should be listed as **open**, not as a conclusion.
- Results differ between runs and apps. The evidence in the files does not change, so compare the citations, not the wording.

Good follow-up questions to try

- "*Show me the evidence that the pad 3 temperature was real and not a sensor fault.*"
- "*Compare this event with the earlier RCA reports in 2_documents.md.*"
- "*Which hypotheses are still open, and what evidence would close them?*"
- "*Write the interview questions for the shift team.*"
- "*Make a timeline of the last 3 weeks for Unit 1 TGB pad 3 against its neighbours and the oil bath.*"

Troubleshooting

Problem	What to do
The AI does not follow the RCA procedure, or writes no report	Type: "*Read 1_instructions.md again and follow it. Write the full report in template DRWPA-FRM-REL-02.*"
The AI says a file is missing or it cannot read it	Check that all six files show as uploaded. Otherwise start a new chat with the all-in-one file.
The AI invents facts (names, values, work orders that are not in the files)	Ask: "*Give the exact file and row for that claim.*" If there is none, tell it to mark the point as open.
It stopped halfway	Type "*continue*".
The answer is too long or cut off	Ask for the report section by section: "*Write sections 1 to 6 first.*" then "*Now sections 7 to 11.*"
Upload limit or "message too long"	Use the single file in `upload-as-one-file/`, a paid plan, or a Project (see Step 2).

What is different from the full version

This chat version holds **extracts** so it fits in a chat window: the sensor data is averaged (4 hours over three weeks, 10 minutes around the event) instead of 1-minute and 1-second values, only the relevant tags are kept, routine maintenance on Units 2 and 3 is left out of the work orders, and the PDF documents are converted to text. The story and the evidence are the same. The AI is told about these limits in `1_instructions.md`.

About your own data

Everything here is generated, so you can upload it to any AI app. **If you later try this with your own company's documents or data, only use an AI environment your company has approved.**

Licence

See `LICENSE`.