

Case Study: Power Plants, Collegiality and Loyalty, Collective Bargaining, Confidentiality, Conflict of Interest

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Three Mile Island Accident



Source: Wikipedia

The Three Mile Island Unit 2 (TMI-2) nuclear power plant in Pennsylvania experienced a partial meltdown on March 28, 1979 which caused an **increase in radiation level and an explosion within the building**, there were no casualties. The reactor was brought under control after 13.5 hours.

Case Study: Power Plants

Here's a breakdown of what happened:

- A malfunction in the demineralizer led to the shutdown of water pumps feeding the reactor core.
- Reactor pressure rose, triggering safety measures to insert control rods and stop the fission process.
- A pressure relief valve remained open, preventing proper cooling of the reactor core.
- Water loss from the core and overheating caused fuel rod damage.
- A chemical reaction between steam and reactor components produced hydrogen gas.

Chernobyl Disaster (1986)



Source: CNN

- The Chernobyl plant used RBMK reactors, with a graphite water cooling system, known for safety vulnerabilities.
- A turbine generator test was scheduled during maintenance, requiring a power reduction to 700 MW.

- **Ignoring Safety Measures:**

- Operators disconnected the emergency cooling system.
- The test was conducted at an abnormally low power level (200 MW).
- Emergency signals and automatic shutdowns were deliberately blocked.

- **Operator Error and Escalation**

- Operators further compromised safety by raising control rods to increase power, causing a rise in reactor temperature and fission rate.

- **Catastrophic Outcome**

- The reactor core melted, leading to a fire and the release of radioactive materials across the USSR and Europe.
- Evacuation of nearby residents was delayed for hours after the explosion.

- **Casualties and Impact**

- Over 30 plant workers died, with 200 suffering burns.
- Long-term health effects resulted in an estimated 8,000 deaths.
- Agricultural production was significantly impacted by radioactive contamination for years.

Safety Lessons from TMI and Chernobyl

- Stronger containment structures to prevent radiation leaks after explosions.
- If power increases during critical tests, like at Chernobyl, should be rejected or halted entirely with safety systems reactivate
- Continuous monitoring of critical components is essential for early detection of issues.
- Establish comprehensive emergency plans.
- Prompt notification of superiors and timely evacuation of nearby residents (both TMI and Chernobyl).

Craig Ihara defines collegiality as a “a kind of connectedness grounded in commitment to the goals and values of the profession”. It is the tendency to support and cooperate with the colleagues.

Elements of Collegiality

- Respect to the ideas and work of others: This results in support and cooperation with one's colleagues. One gets back the support and cooperation in return, and this is mutually beneficial.
- Commitment to moral principles: Commitment is towards moral decisions, actions, goals of the organisation and values of the profession.
- Connectedness: It means the shared commitment and mutual understanding. It ensures the absence of egoism and paves way for progress in both.

Loyalty has two sides:

- Agency Loyalty is about fulfilling your contractual obligations. You complete assigned tasks and cooperate with others.
- Attitude Loyalty It's about feeling a sense of belonging and wanting to contribute positively. This loyalty is ideal when the organization works for good. However, it shouldn't extend to unethical practices.

Collective Bargaining

Collective bargaining is a process where trade unions negotiate for better economic benefits for their worker members. It can involve negotiation, verbal threats, or even strikes.

Ethical Collective Bargaining

- Bargaining should be constructive, persuasive, and based on mutual understanding.
- Destructive tactics harming people or property are unethical.

Public Interest vs. Worker Interests

- A union's actions shouldn't harm the public. Strikes by essential workers can threaten public safety and health.
- Collective bargaining by engineers should consider the public good.

Professionalism vs. Unionism

There's disagreement about the ethics of union collective bargaining.

- **Professional Societies' Perspective:**

- Engineering societies like NSPE believe professional integrity and loyalty to employers come first.
- See strikes as unprofessional and against the dignity of the profession.
- Engineers should act as faithful agents or trustees, putting employer interests before self-interest.

- **Considering worker needs:**

- Can engineers be truly loyal if employers ignore worker safety or underpay for extended periods?
- Unions can be a necessary tool to ensure fair treatment.

Confidentiality is about keeping information about employers and clients secret, and is a cornerstone of ethical teamwork.

Importance

Several ethical theories justify confidentiality:

- Rights and Duties: It protects stakeholders' rights, like a company's intellectual property, and upholds the mutual trust between employers and employees.
- Utilitarianism: creates the most good for the most people.

Moral Principles

Confidentiality is supported by these moral principles:

- Respect for Autonomy: Individuals and organizations have the right to control their information.
- Respect for Promises: Employees honour agreements with employers regarding sensitive information.
- Trustworthiness: Maintaining confidentiality is essential in professions like law and medicine, fostering trust and open communication.
- Respect for Public Welfare: When used ethically, confidentiality benefits the public. For example, doctor-patient confidentiality encourages patients to seek help, leading to better healthcare.

Confidential Information: Types and Challenges

Types of Confidential Information:

- Privileged Information: Information accessed due to job assignment, like details about a defence project.
- Proprietary Information: Knowledge and procedures owned by the organization, protected legally like trade secrets, quality manuals etc.

Confidentiality by Severity:

- Obvious Information: Highly sensitive data related to unreleased products, designs, formulas, or technical processes. Leaking this could threaten the company's survival.
- Less Confidential Information: Business details like employee numbers, supplier identities, marketing strategies, or manufacturing costs.

Switching Jobs and Confidentiality:

- **Arguments for Maintaining Confidentiality:**

- Employee integrity and professional ethics demand protecting confidential information even after leaving a job.

- **Counterarguments:**

- Employees' expertise and knowledge are valuable assets they bring to a new role.
- Courts have balanced employer rights with employee rights to career advancement.

Management Strategies (with Limitations):

- Contracts limiting future employment geographically, by time gap, or by type of job (not legally enforceable everywhere).
- Offering financial compensation in exchange for restricting future job options.
- Limiting access to sensitive information can hinder creativity and innovation.

Conflict of Interest

A conflict of interest arises when an employee has multiple interests that could potentially clash, which might hinder their ability to fulfill their obligations to their employer or client.

Types of Conflicts of Interest:

- Actual Conflict: Objectivity is compromised due to outside interests, leading to an inability to fulfil one's professional duties.
- Apparent Conflict: Creates the impression that professional judgment is compromised.
- Potential Conflict: Involves the interests of an employee's spouse, relative, or friend, potentially influencing their judgment in favor of the outsider.

Distinguishing from Conflicting Interests:

Imagine a student struggling to study for four exams but only having time for three. This is a situation of conflicting interests, not a moral dilemma.

Favorable Contract: A conflict arises when an engineer has the power to award contracts (subcontracts, purchase orders) to a company where their spouse or they themselves have a financial interest (stock-holding).

Bribery vs. Gifts

Feature	Bribe	Gift
Timing	Before a decision	After a decision
Cost	Large Amount	Small amount
Quality	Poor	Good/High
Giver's Relationship	Friend	Not necessarily a friend
Transparency	Secret	Open
Motive	Undue favor expected	Favor or gratitude
Consequence on Employer	Damages reputation	No damage

Company policies on gifts:

While codes of ethics generally discourage gifts, some companies may have flexible policies allowing small tokens. Gifts should not influence professional judgment.

Moonlighting:

Working for two companies if:

- The companies are competitors, suppliers, or customers of your primary employer.
- It leads to exhaustion and harms your performance in both jobs.

Insider Information:

Using confidential information from your employer, client, or business partner. Examples include trading stocks based on knowledge of mergers, acquisitions, or new strategies.

The End.