

IEEE-USAC's ROLE IN THE IEEE AMICUS BRIEF FILING IN THE BAY AREA RAPID TRANSIT (BART) CASE

In the early days of IEEE-USA, USAC leaders worked with members of the IEEE Social Implications of Technology Committee to convince the IEEE Board of Directors to file an IEEE amicus curiae brief in the Bay Area Rapid Transit (BART) case in the California courts opposing the “wrongful discharge” of three engineers for raising safety concerns regarding the new systems controls that IEEE argued were consistent with their ethical obligations. Before the case was ultimately reviewed on appeal, the three engineers received an out-of-court settlement resulting in dismissal of the case.

In this piece, Stephen Ungar, Professor Emeritus of Computer Science and Electrical Engineering at Columbia University, provides a history of IEEE's participation in the BART Case. During his active engagement as an IEEE member and IEEE Fellow, Ungar served at various times as a member of the IEEE Board of Directors and as a member of the IEEE Technical Activities, U.S. Activities, Publications and Educational Activities Boards. He was a member of the IEEE Ethics Committee from 1995-98, serving as chairman in 1997-98, and taking an active role in the development of the original IEEE Code of Ethics and its 1990 revision. For his service to the profession, Dr. Ungar has received many awards including the IEEE-USAB Distinguished Contributions to Engineering Professionalism in 1987.

IEEE-USAC/USAB is often credited as being the impetus behind IEEE's brief filing in the BART Case, but Ungar correctly describes IEEE-USAB's role in support of an initiative by the IEEE Committee on the Social Implications of Technology to convince the IEEE Board to take action. Both groups were closely aligned and shared proactive volunteers members, and it is important to recognize the primary role that CIST played. The BART case was an important milestone in the development of IEEE's Ethics programs, prompting the creation of an IEEE-USAC/USAB Ethics Committee that was later absorbed after the formation of the IEEE Member Conduct Committee for Ethical Discipline and Support in 1978.

IEEE AND THE BAY AREA RAPID TRANSIT CASE

By Stephen H. Ungar

The Bay Area Rapid Transit (BART) system is a fast (eighty miles per hour top speed) commuter rail system serving three counties in the San Francisco Bay Area. It was authorized by public statute in 1957 and went into service in 1972. The prime contractor for the BART project was PBTB, a consortium of three large engineering firms, Parsons-

Brinkerhoff, Tudor, and Bechtel. During the course of design and construction, three engineers undertook principled actions that played a significant role in advancing the development of engineering ethics in the United States.

The Engineers and Their Actions

Holger Hjortsvang, an experienced systems engineer, was involved with the Automated Train Control System (ATC). Max Blankenzee, a young programmer analyst, worked with Hjortsvang. They became concerned about the way the ATC subcontractor, Westinghouse Corporation, was doing its job. A principal issue with Hjortsvang was the absence of a systems engineering group to oversee the development of control and propulsion systems. Hjortsvang and Blankenzee reported their concerns to their managers, both orally and in writing. The response was "don't make trouble." Simultaneously electrical engineer Robert Bruder, monitoring the contractors installing and testing control and communications equipment, found that reports to his managers about sloppy work were ignored.

In November 1971 the three engineers brought their concerns in confidence to BART Board of Directors member Daniel Helix, providing him with written material. This led Helix to bring up the issues of ATC safety before a meeting of the Board. The Board, however, rejected the position of the anonymous engineers, as represented by Helix, by a large majority.

In short order BART management was able to identify the three engineers who had provided Helix with the information he brought to the meeting. Hjortsvang, Blankenzee, and Bruder were then fired without written cause or appeal. There are indications that their efforts to find new jobs were impeded by BART management. About a year later, they filed a wrongful discharge suit against BART.

Subsequent Events

Prior to the BART board meeting, Bruder, a licensed Professional Engineer, phoned William F. Jones, President of the California Society of Professional Engineers (CSPE), outlining the situation and requesting support. At Jones's request, CSPE Diablo Chapter members Roy W. Anderson and Gilbert A. Verdugo reviewed the situation and corroborated the essentials of the arguments made by Hjortsvang, Blankenzee, and Bruder.

Following the firings, Jones unsuccessfully tried to reach BART's general manager, B. R. Stokes. A meeting with Chief Engineer David Hammond was of no avail. BART management declined all requests to discuss the firings on the grounds of possible or pending legal action.

The CSPE then wrote a report about poor engineering at BART, which it sent to the California State Senate. This led to a staff study concluding that the BART project was not going well, but ignoring the plight of the three engineers whose action triggered the investigation.

The validity of the engineers' concerns was decisively confirmed on October 2, 1972, three weeks after BART began carrying passengers. A speed control command, corrupted by a short circuit in a transistor, caused a BART train to accelerate instead of slow down, resulting in a crash at the Fremont station. Fortunately there were no fatalities and only a few injuries.

The California State Senate commissioned a study by a three-member Blue Ribbon Committee of distinguished engineers that confirmed that the engineering of the ATC and some other aspects of the BART system were below par. Panel member Bernard Oliver, a past president of the Institute of Electrical and Electronics Engineers (IEEE), sent an incisive letter to a Westinghouse vice president specifying poor decisions that suggested to him that "the design [of the ATC] did not enjoy the attention of your top people" (Unger 1994, p. 252).

In November 1972, some CSPE officers, including, incredibly, Jones, charged the Diablo CSPE Chapter with unethical behavior in connection with their investigation of the BART project. They cited an ethics code provision against criticizing other engineers. This effort backfired when the CSPE Board of Directors, following the recommendation of the committee that adjudicated the case, not only rejected the charges, but commended the chapter for its efforts to protect the public safety, health, and welfare. However the CSPE faded out of the picture toward the end of 1972, apparently as a result of pressure from members employed by the consortium of large engineering firms running the BART project.

The IEEE Response

In September 1973 the IEEE Committee on Social Implications of Technology (CSIT) published an article in its newsletter describing the treatment meted out to the three BART engineers. The following March, the CSIT unanimously passed a two-part resolution addressed to the IEEE Board of Directors (BoD). Part (a) called for the establishment by the IEEE of mechanisms to support engineers whose acts in conformity to ethical principles may have placed them in jeopardy. Part (b) asked the IEEE to intervene on behalf of the BART engineers.

The BoD, advised by the IEEE U.S. Activities Committee (USAC), and an ad hoc committee that included Joel Snyder, Victor Zourides and Frank Cummings (USAC legal counsel), responded to part (b) by commissioning an amicus curiae brief to be presented to the court hearing the engineers' lawsuit. The brief was to enunciate general principles, rather than to side directly with the engineers. As ultimately drafted by Frank and Jill Cummings, the brief urged the court to determine that, if an engineer was discharged because of a bona fide effort to conform to an ethical obligation to protect the public safety, the termination should be considered a breach of an implied term of the employment contract. The brief was filed in January 1975. Shortly afterward, the engineers accepted an out-of-court settlement reported to be \$75,000. The legal concepts argued have been used in subsequent cases, sometimes strengthened by a court's permitting the plaintiff to allege an action in tort, which opens the door to punitive damages.

The response to part (a) of the resolution took longer. In 1978 procedures were implemented whereby IEEE members (later extended to include other professionals in fields covered by the IEEE) could appeal to the IEEE Member Conduct Committee for help if their careers were jeopardized in retaliation for acts in conformity to the principles underlying the IEEE Ethics Code.

The BART engineers underwent a painful ordeal that impacted their professional and personal lives. It took them between one and two years to get back on track professionally. Looking back, they felt that they could not have justified any other course of action. And the BART case became a major teaching tool for engineering ethics courses during the following decades.

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