

110TH CONGRESS
1ST SESSION

S. 2263

To require the Director of the National Institute of Standards and Technology to establish an initiative to promote the research, development, and demonstration of miner tracking and communications systems and to promote the establishment of standards and other measurement services regarding underground communications to protect miners in the United States.

IN THE SENATE OF THE UNITED STATES

OCTOBER 30, 2007

Mr. WEBB introduced the following bill; which was read twice and referred to the Committee on Health, Education, Labor, and Pensions

A BILL

To require the Director of the National Institute of Standards and Technology to establish an initiative to promote the research, development, and demonstration of miner tracking and communications systems and to promote the establishment of standards and other measurement services regarding underground communications to protect miners in the United States.

1 *Be it enacted by the Senate and House of Representa-*
2 *tives of the United States of America in Congress assembled,*

1 **SECTION 1. SHORT TITLE.**

2 This Act may be cited as the “Mine Communications
3 Technology Innovation Act”.

4 **SEC. 2. FINDINGS.**

5 Congress finds the following:

6 (1) The failure of miner tracking and commu-
7 nications devices or lack thereof in mines severely
8 hampers rescue efforts in the event of emergencies.

9 (2) Mines, particularly underground mines,
10 have properties that present unique technical chal-
11 lenges for the integration of currently available
12 tracking and communications systems. These prop-
13 erties include the lack of a clear path or open air
14 which is required for radio signals and WiFi. Addi-
15 tionally, because coal is an absorptive material, less
16 than 10 percent of the radio spectrum that is used
17 above ground can be used underground. A fraction
18 of that (only about 1 percent) radio spectrum is ac-
19 tually allocated for commercial communications pur-
20 poses. As a consequence, the availability of miner
21 communication equipment is severely limited.

22 (3) Research and experience have shown that
23 communications and tracking systems may not work
24 equally well in every mine or in every emergency sit-
25 uation, and therefore several different systems may
26 be necessary for development and integration.

1 (4) Because of the serious challenges of the
2 mine environment and the limited market provided
3 by the mining industry, much needed technology has
4 not yet been developed by the private sector or is not
5 commercially available in the United States.

6 (5) Furthermore, due to the regulatory struc-
7 ture of the industry and the lengthy approval proc-
8 ess for mine tracking and communications systems,
9 research must be accelerated so that next generation
10 technology can be quickly and efficiently integrated
11 into mines to protect the safety of miners.

12 (6) The National Institute of Standards and
13 Technology is well positioned to help accelerate the
14 development of mining tracking and communications
15 technology. The National Institute of Standards and
16 Technology has a long history of working in conjunc-
17 tion with industry to invest in longer-term, high-risk
18 research which yields national benefits far beyond
19 private payoff. Further, the National Institute of
20 Standards and Technology builds partnerships with
21 industry to leverage existing research and develop-
22 ment to drive next generation technology.

23 (7) The National Institute of Standards and
24 Technology is well-positioned to accelerate develop-
25 ment of consensus mining communications standards

1 given the extensive work that the organization has
2 done in the field of emergency communications to
3 develop standards and technologies for interoperable
4 wireless telecommunications and information sys-
5 tems.

6 (8) In developing such standards, the National
7 Institute of Standards and Technology should work
8 in cooperation with the National Institute for Occu-
9 pational Safety and Health and the Mine Safety and
10 Health Administration, and other relevant public
11 and private stakeholders, to build on existing tech-
12 nology and knowledge regarding mine communica-
13 tions systems.

14 **SEC. 3. MINE COMMUNICATIONS AND TRACKING RE-**
15 **SEARCH AND DEVELOPMENT PROGRAM AU-**
16 **THORIZATION.**

17 (a) ESTABLISHMENT.—The Director of the National
18 Institute of Standards and Technology shall provide for
19 the establishment of a program of research, development,
20 and demonstration that includes the establishment of best
21 practices, adaptation of existing technology, and efforts to
22 accelerate the development of next generation technology
23 and tracking systems for mine communications.

24 (b) COORDINATION.—In carrying out this section, the
25 Director shall coordinate with relevant Federal agencies

1 and industry to evaluate areas of research and develop-
2 ment and best practices that will be most promising in
3 protecting miner safety.

4 (c) OPTIONAL FOCUS.—In establishing this program,
5 the Director may focus on the following communications
6 and tracking system characteristics:

7 (1) Systems that are likely to work in emer-
8 gency situations.

9 (2) Systems that work in coal mines, with spe-
10 cial attention paid to deep underground coal mines.

11 (3) Systems that provide coverage throughout
12 all areas of the mine.

13 (4) Hybrid systems that use both wireless and
14 infrastructure based systems.

15 (5) Functionality for 2-way and voice commu-
16 nications.

17 (6) Systems that serve emergency and routine
18 communications needs.

19 (7) The ability to work with existing legacy sys-
20 tems and to be quickly integrated.

21 (8) Propagation environment characterization,
22 performance metrics, and independently derived vali-
23 dation tests to verify performance for standards de-
24 velopment.

1 **SEC. 4. STANDARDS REGARDING UNDERGROUND COMMU-**
2 **NICATIONS.**

3 Consistent with Office of Management and Budget
4 Circular A–119, the Director of the National Institute of
5 Standards and Technology shall work with industry and
6 relevant Federal agencies to develop consensus industry
7 standards for communications in underground mines. The
8 Director shall also develop and provide any needed meas-
9 urement services to support implementation of these
10 standards. In their efforts to help develop these standards
11 and related measurement services, the following issues
12 should be addressed:

13 (1) The appropriate use of frequency bands and
14 power levels.

15 (2) Matters related to interoperability of sys-
16 tems, applications, and devices.

17 (3) Technology to prevent interference.

18 **SEC. 5. AUTHORIZATION OF APPROPRIATIONS.**

19 There are authorized to be appropriated to the Direc-
20 tor of the National Institute of Standards and Technology
21 such sums as are necessary for carrying out this Act for
22 fiscal years 2009 and 2010, to be derived from amounts
23 authorized under section 3001 of the America COM-
24 PETES Act.

