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Secretary  
U. S. Nuclear Regulatory Commission  
Washington, D.C. 20555  
attention: Docketing and Service Branch

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OFFICE OF SECRETARY  
DOCKETING & SERVICE  
BRANCH

RE: Radiation Safety Training and Certification of  
Industrial Radiographers by Third Parties

Gentlemen:

I strongly support mandatory training and certification of industrial radiographers by third parties for the reasons outlined below.

I believe that the typical, small service companies involved with industrial radiography flagrantly violate the purpose and intent of recommended practices for employee training in radiation safety. Furthermore, the service company employees are aware of these violations by their companies and this knowledge has a very negative impact upon their attitude toward radiation safety for themselves and the public. Since I work in an industry where industrial radiography is common practice, I am convinced that my risk of excessive radiation exposure from industrial radiography operations far exceeds my risk of exposure from nuclear power plant operations.

I have had some contact with both state and federal regulators for industrial radiography over the past twenty years in industry. While I think there has been some improvement in the attention to radiation safety over that period, I do not believe that these regulation groups have either the will or the support from industry to force appropriate radiation safety training within the service company industry. Therefore, I support mandatory radiation safety training and certification by third parties as the only realistic solution to this problem. I have cited some examples below of things I have seen and been told to illustrate why I think that the cost of the third party training is not really a factor in enacting this regulation.

This following incident occurred in a West Texas pressure vessel (ASME Code Sect VIII) fabrication shop where I was present several years ago. A radiographer entered the shop just prior to morning break time and proceeded to set up for a radiograph of a repair weld which had been made on one of the pressure vessels. When I inquired what was about to be done, I learned that the plan was to make an exposure of the weld during the break in order to avoid taking the vessel out of the shop to a remote location for the

exposure. Typically the employees moved away from the vessels in order to take some refreshment and relax for a few minutes. First, I noticed that this radiographer had no survey meter visible and this really concerned me as the work area was very congested for radiography to be underway. When I butted into the proceedings and began questioning the radiographer about the survey meter, I found that he also had no film badge or dosimeter in the area. As I began to get more and more concerned, I was told that this young fellow's safety equipment (film badge, dosimeter and survey meter) were all located at his home. This fellow assured me that he didn't need all that stuff because he was really good at his job and he was always careful. I happened to know that this "radiographer" was less than 20 years old and had about 1 year of experience in the business. At that point I told the kid that if he cranked out his Ir 192 source there in the crowded shop with no safety gear, I was going to fly to Austin and do my best to get him and his company barred from industrial radiography for life. So he shut down and went home to get his gear. It was obvious that this kid had no appreciation for the risk to himself and certainly no concern for me or the other people in the area. I also discussed this with the owner and operator of the service company and I believe that the guy neither knew nor cared about the long term effect of radiation exposure to his employees or the public. I also believe that the owner wanted inexperienced employees who had no appreciation of what risk were involved since they would work cheaper and get more done in a day.

This incident was described directly to me by a young employee of an industrial radiography service company. After about one month of on-the-job training with his company (his first employment in industrial radiography) this fellow was sent alone with a truck to a location near Marathon, Texas which was a considerable distance from his base in Odessa, Texas. During the process of shooting a few small diameter pipe welds there, the end came off his source guide tube. This problem allowed his Ir 192 source to exit the end of the guide tube and the control cable to disconnect from the control crank gear. A situation like this makes even well trained and experienced radiographers sweat but this kid was alone, several hours drive away from home base, out of radio contact range and afraid to tell the management at the customer's location for fear that his company (and he) would be fired for the accident. This fellow told me that he first removed and hid his badge and dosimeter. Then he walked up to the end of the guide tube and used his hands to re-insert the source back into the guide tube far enough for the control cable to be engaged by the gear. The only good news was that the job was to shoot small diameter pipe and his source was down around 5 curies. I asked him what ill effects occurred to his body. He told me that the skin on his hand was burned and looked much like a heat burn for several days. He also said he felt nausea but didn't know if that was due to the radiation or the fear and tension the accident caused. I don't think that this fellow had any real appreciation that the large exposure might have very serious long term effects

upon his health. Also, he had no idea of what he could or should do to mitigate the effect of the exposure.

The following incident was described to me by a good friend who had heard it from the assistant radiographer who related the tale to my friend. The incident was said to have occurred at a pipe line construction location (I think road crossing change out) near Corpus Christi, Texas. Girth welds were being radiographed with what is called a pipeliner camera (source container straps to pipe with shutter movement rather than source movement through a tube). Apparently some of the lugs and chain for attachment of the camera had broken and interrupted the progress of the job. Apparently replacement exposure equipment was not quickly available and there was pressure to complete the radiography so that the pipeline could be covered. The assistant told my friend that the radiographer told him, the assistant to get in the ditch and hold the camera in position during the exposure. Apparently the assistant knew enough to know that this was a real risk so there was some disagreement about this solution to the problem. According to what the assistant told my friend, when the radiographer told the assistant to hit the ditch or be fired, the assistant gave in and held the pipeliner camera in position during one or more exposures to complete the job. I believe that the source strength in this incident was fairly high as the job involved large diameter and heavy wall line pipe welds. I do not recall what my friend told me about the short term symptoms this excess radiation exposure caused in the assistant.

My observations about costs vs benefits for third party training.

In these three reports cited above, one common factor was exploitation of inexperience and ignorance of very young persons who typically consider themselves relatively invulnerable to physical harm anyway. I submit that there is an unknown and potentially very large long term cost to our society when industrial radiography is allowed to occur like this. I submit that we have no way to associate long range health effects with incidents like those described above.

I believe many workers around industrial radiography are exposed with no knowledge of what is happening to them and so there is no record of over-exposure. The young fellow who pushed the source back into position first hid his film badge and dosimeter so there was no record of that over exposure. If he someday develops a malignancy in his hand or arm, he may not even remember the incident or make a connection. The assistant who held the camera in position was told to hide his film badge and dosimeter so this overexposure was deliberately concealed. If this assistant eventually develops a malignancy, he will likely make the connection because my friend spent several weeks trying to convince the fellow to file a wrongful injury suit at the time but the kid was afraid of the consequences to his employment. In any case, the same service company was involved in all three of these

incidents and I think is now out of business. Unfortunately, this company was one of the "boom businesses" which "trained and certified" a fairly large number of new employees in the industrial radiography business. The attitudes these people learned about radiation safety during the first few days and weeks on the job will die slowly, no matter where they work. I believe this is a serious problem in our society.

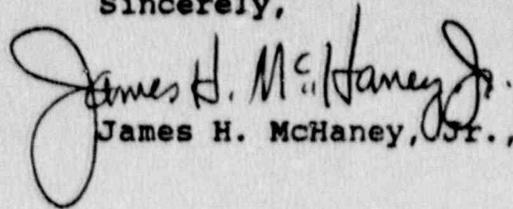
**Comments about radiation safety in health care industry.** As I became involved with industrial radiography some 20 years ago and learned more about radiation safety, I became very concerned and angry about the lack of concern about radiation safety in industry and the lack of effective regulation for radiation exposure. This made me more aware of what happens in the health care industry. I have encountered health care workers involved with "human radiography" who were just as ignorant and unconcerned as pipeline radiographers. Several years ago I was taking a pre-employment physical which required a chest x-ray. I requested a shield for my lower torso and the technician became openly hostile about my request. The technician finally found a shield for me, which was obviously infrequently used and that was very difficult to use because of broken straps. The doctor running this physical exam business, which profited from doing many federally required DOT physical exams, was clearly hostile to me when the technician reported my request to him. He was even more hostile and threatened to sue me after I complained to the state health department about the operation of this x-ray business. I strongly support a similar program for third party radiation safety training and certification for health care workers, as I believe that the risk and potential cost to society there is even greater than for industrial radiography. I strongly believe that there are persons in health care management (such as the doctor running this exam business) who are just as unconcerned about the public's exposure to radiation as are the worst owners of industrial radiography service companies.

**In summary.** I believe that if the visual or print media really understood the risks that industrial radiography posed to the employees in that industry and to the public and then actively distributed that information, there would be a public outcry for increased regulation equal to or greater than the protests related to nuclear power plants. I think that the reasons that this has not happened is that the radiation safety story really doesn't package up very well in the "McNews" format which is so dominate today. While a ruptured power plant might make a nice "McNews" headline, someone whose hand or gut is slowly rotting away doesn't make a tight 45 second spot on the evening news.

The notice in the Federal Register refers to statistics for reported overexposure incidents, and this is natural since there are no hard data about the unreported overexposure incidents. However, I believe that the unreported incidents, like the two

second-hand stories I have cited above and the one potential incident I observed first-hand, are where the major health risks are located. As long as small service companies control the radiation safety training of their employees, the attitude that the regulations are just there for show will exist. State and federal regulators need to clearly demonstrate that the rules are there to be followed and for a good reason. One way to make a clear statement about the intent of the radiation safety regulations is to place the responsibility for the radiation safety training and certification in the hands of a third party who has no financial gain from sloppy safety practices.

Sincerely,

  
James H. McHaney, Jr., P.E.