

Alrighty First off, people've been asking about handouts There is handouts on the website, AAPM website, 253 pages of handouts Now, 96 of those are the slides that you're gonna see today, two of 'em, one of 'em is the test that a couple pages on the test that you'll need to help in your certification on this thing The other two are the answers to the test, and the remaining hundred and fifty something pages happens to be the Federal Register of the last DOT reg change that that is rather rather significant I don't know how in the world I'm going to do this this afternoon This is the first time I have tried to boil a basically a eight-hour presentation down into four So if you'll bear with me, fine I also would like to say that, I don't know the rules, as far as I'm concerned if you have a question make your question known at that point 'cause it's a whole lot easier to get it out of the way then And if we start getting too far behind

then Herb or I will sort of let you know, but it's best if you do if you do have a question, you want to say something or if you want to make a point, let's get it out of the way rather than waiting until all the questions at the end This is not that type of presentation The I will answer specific questions on the certification process toward the end of the end of the presentation Now, usually what I do, as Herb will tell you, in a course such as this, I like to sort of poll the class as to find out who in the world you are, who you're with, what's your ship, and but we got too many people here, we don't have enough time to do that today So I would sort of like to take a sampling of basically just part of this as to what in the hell do you want out of me this afternoon So if somebody's brave enough, how about standing up and telling me what you want out of me Go ahead sir A certificate so we don't get in trouble with the DOT OK, number one

number one, you will not get a certificate from me but I will explain the certification process and the reasons for it Alright, somebody else What do you want out of me [audience comment] You don't want anything out of me Bye See ya later Yes sir Why is that we do the things that we are supposed to do You're asking why regulations are regulations That's an awful tough one to answer Basically to get some consistency, to get get communication with the carriers that are involved in transporting hazardous material, to have a uniform process that everybody has to adhere to That sorta thing Yes sir I guess my question is why ____ I sit through a class for typically 8 hours for something that a company has paid one of their employees to take to find out how they should ship radioactive materials They're gonna send me all the paperwork and everything I need with directions to do it I've been doing it for 26

years and now all of a sudden they're telling me I get a DOT inspector in the hospital tellin' me that I can't do it anymore I don't this is what I don't get As you know, the as you know, in the regulatory game, documentation is the rule of the day And so what they're talking about here, and I can give you some adverse examples as to people shipping without proper training as to what happens So about the only way that they have of controlling this is to require, which they did back in 1993, this is nothing new, this rule was passed, the training rule was passed in 1993, became effective October 1, 1993, for the training requirement if you are involved in the shipment or transportation or packaging of any hazardous materials, including radioactive materials Way back in the back, yes sir The thing is I ship things mostly ____ and about half the time they get returned to me even though the paperwork the same as I sent before that went

through So what I would like to do is find out what the right way to label this stuff is Alright, I

hope I can answer that and also maybe I think I have enough, I don't know, we'll try and see, but I may have enough of a of the FedEx checklist to maybe hand out to to most of you today That will also just give you some sort of idea, and it's certainly not proprietary information But no, we'll get to uniformity... Yes sir I would like to know if there's any relationship at all between DOT and NRC I will also cover that I will also cover that The answer is the relationship is number one The fact that in 19 the late 1960s more or less, the Department of Transportation signed a memorandum of understanding with then the Atomic Energy Commission In order for the Atomic Energy Commission to review the Type B packages which was then came out as a new transportation rule from the IAEA So this memorandum of un the the the tie-in is

because all the expertise was back at the Atomic Energy Commission laboratories, only Type B packaging And so the official tie-in between the NRC and the Department of Transportation is the fact that the Department of Transportation, rather than setting up a new bureaucracy has a memorandum of understanding that the old AEC, now NRC, will review the Type B packaging That's the total official thing Another part of it is that the a lot of people get confused, is that the NRC does regurgitate the DOT rules to apply to their licensees In recent years, I I guess I'm interested in do they talk to each other now I just went through an NRC inspection and there was never any mention of any DOT training by the NRC They talk to each other The I can I can attest to that As to whether the NRC people are going to enforce and inspect against DOT rules is sort of up to them You'll find some inspectors do, some inspectors don't Yes sir The

DOT inspects _____ DOT regulations... Yes sir Well, the FAA is a part of DOT, remember So yes, they do OK We're getting an overflow crowd, which I'm glad to see Thank you Wherever you wanna try and bring in more chair or just let 'em suffer OK, we had a I'm gonna... Yes sir I'm the only person who ships material out from our facility, but if I'm not there somebody else sometimes receives them _____ doesn't like the survey and a lot of times _____ Is that peson _____...Receiving is not a DOT function Receiving is an NRC agreement state function...So the answer's no...No You have the receiving regulations within Part 20 of the NRC regulations and are they equivalent to state regulations Yes ma'am I would like to know how to go about after _____ this training _____ and train my co-workers... Yes, yes I will explain that hopefully fairly pretty much in detail OK, with that in mind, why don't

we move on and... My name, I've already been introduced, that's who I am Big deal So let's get into this thing When we start talking about the regulations, the Department of Transportation regulations happen to be found in Parts 171 to to 185 If you want you a nice website, URL is right there below it It's called hazmat dot gov, will get you to those regulations, the the regulations that are up to date in the Federal Register things One thing you should know is that the fountainhead for transportation regulations comes from the International Atomic Energy agency, and with the idea of there being internationally uniformity for transportation regulations These are based upon the so-called safety standard series, it's entitled the Regulations for the Safe Transport of Radioactive Material and the last one that is out is the 1966 edition which was revised and is called TS-R-1 Now, these set reg particular regulation

was not adopted by the United States until the publication of the Federal Register on Febru excuse me, January the 26th of this year, became a voluntary effective date of February 25 of this year with a mandatory effective date of October 1st of this year Now, I'm going to be teaching

this course based upon those regulations because there's now use you any longer getting back to the old regulations. You're you may use them and should be able to use them from February the 25th, so we will then start talking about and be using those regulations. Let's start talking about one of the real confusing things that comes out of this. If you pick up the telephone and you call FedEx or if you call Delta Airlines, or if you're going internationally you call Luton Air or Air France, somebody like that, and asked a dangerous goods or radioactive material question, you get somebody that's sitting at a desk normally and they're going to refer you to something called

IATA. IATA is happens to be the International Air Transport Association, and it's this booklet here published every year by the International Air Transport Association which happens to be out of Montreal, Canada. Now, this thing is a misnomer. It really says here dangerous goods regulations. Well, that's a bunch of you know what simply because this is nothing more, ladies and gentlemen, than a tariff. And it does not regulate a damn thing whatsoever. This is a country club of good work airlines that get together and so it's a tariff, this is how they're going to do things. So those people at these organizations think that this is a stand-alone document. It is not a stand-alone document. And so you got to understand how you're able to use the IATA regulations. Well, how you can use the IATA regulations happens to be via a similar regulation called ICAO. ICAO is the International Civil Aviation Organization. This is an arm of the

United Nations and this happens to be mentioned in Title 49 where it just so happens that IATA is upper-compatible with ICAO. In other words, anything that's in ICAO happens to be in IATA. And in addition, there's such things as in IATA that are over and above this. Now, in order to get uniformity the ICAO regulations which happens to be called, and I just showed you there, the ton of instructions for the safe transport of dangerous goods by air, you don't call it a regulation, but it's more of a regulation than the IATA happens to be. There is a tie-over in Title 39 that permits you under certain conditions that you need to understand to be able to use ICAO and it has to be able to use IATA. That tie-over happens to be in a section in Title 49 entitled 49 CFR quoted from the regulations, 171.11 - 11. And it provides an alternate means for the classification, marking, labeling and documentation of 49 CFR only for Parts 172 and Parts 173

It has nothing to do with the rest of it. And so you gotta think like a lawyer many times when you're into this business. Alrighty. Now, within this there happens to be certain exceptions for the let me be sure I didn't skip one. Nope. Happens to be certain exceptions in there. How we write control quantities, something that you people, without being physicists associated with medical institutions or facilities, we're not going to really encounter. To give you an idea as to how we write control quantity is or how we write control quantity is where you got a package containing approximately 27,000 curies of something. Maybe a little bit less or a little bit more in certain circumstances, but approximately 27,000 curies. Anyway, it says that the highway route control quantity part out of the US regulations, even though you're going to be referring to IATA and ICAO, will prevail. It also says that the Type B package competent authority

certificates must prevail. And there happens to be four countries, the US, Canada, Japan and Denmark, that requires revalidation for all Type B packages even though there is a BU package (where the U stands for unilateral which said should be the fact that don't need all of this. But four countries, the US, Canada, Japan and Denmark, require revalidation. Again, I'm going over this hurriedly because I don't think most of people are gonna be involved with a Type B quantity

on an international basis 49 CFR applies to radioactive material packages on passenger-carrying aircraft. This is a congressional law. This doesn't make any sense at all because if you look at the law it basically says that a rad exposure from an industrial shipment is more dangerous than a rad exposure from a medical shipment...or a research shipment. Obviously that's not very logical, but who says that Congress is logical at all times anyway and this goes

back to a congressional act in about 1972 or 1973 because of a bunch of adverse occurrences on airlines before the days of FedEx as an example, particularly Delta Airlines, and is both a medical – not medial – gee, I found a typo in the thing – is a medical or research in through there, and the research is not medical research, it is pure research believe it or not. And you're looking at the idiot that is responsible for that term research in that context. I'll not take the time to tell the story but it's sort of an interesting story about the Washington politics and smoke-filled rooms and everything else, but it is also a past research. What it does what this is really saying here is that unless your shipment is for medical or research purposes, and unless the transportation index, which we'll define later, does not exceed 3, then you cannot put it onto a passenger-carrying aircraft. It must go onto a cargo only aircraft. Excepted packages that we

will talk about because a lot of you can solve your shipping problems. Well, what's going to be excepted packages, and when we say "excepted" here, then those excepted packages are excepted from certain package specifications, certain marking specifications, all labeling specifications, all shipping paper da specifications on the thing. So it makes life a whole lot easier if you can classify your shipment as an excepted package. Also, I'd like to emphasize terminology here. There are such things as excepted quantities in other parts of the Department of Transportation regulations for the other hazardous classes. And there are such things as limited quantities. Well, the limited quantities in radioactives has nothing to do with limited quantities of other hazardous classes. The excepted packages here, you'll find that limited quantities is a subcategory of the excepted packages. Also, this bridge from Title 49 to ICAO and IATA says

that the A1 and A2 activity values must adhere to Title 49. Well, this has always been a problem. Right now we are in good shape internationally because if you were shipping internationally, the US has been as much as ten to fifteen years behind the rest of the world in adopting up-to-date transportation regulations. So if you were shipping to some place and internationally out of the US, then you may have to look at both the A1 and A2 quantities in the US because A1 and A2 quantities in the international community, and what you would find out here is that you would need to choose the lesser of the two that happen to be applicable at that point so that you could satisfy both regulatory authorities on the US side and on the foreign side. Alright, so the definition of radioactive material must adhere to 49. Right now we're in good shape because as of February the 25th the new definition of radioactive materials, and I'll be talking to you again

in a few minutes, whereas the old definition of radioactive materials happen to be that any radioactive material with the specific activity no greater than 70 becquerels per gram, approximately two nanocuries per gram, was not radioactive for transportation purposes. Alright. That has now changed. It is now changed to where we now have it has become more complicated but there's some advantages to it, it is now changed to where we happen to have definitions for radioactive material for each specific radionuclide in the tables. And I'll show you how we can do apply those in a little while. That's the bridge from 49 to over OK. Again,

as I've said before, the International Air Transportation Air Transport Association, the dangerous goods regulation is not a regulation but it's a policy, it's a tariff used exclusively by airlines. This is what they talk about. So if you're going to communicate with the airlines, then

you best learn to speak their language which happens to be IATA – I-A-T-A. And as I have already said, it's upper-compatible with ICAO Misconceptions. A lot of people are confused as to whether this type of training is required on a two-year basis or a three-year basis. The reason for the confusion is that in IATA Section 1.5.0.3 says that a two-year IATA says we require two years. Well, malarkey! Who is IATA going to find? They can't find anybody on the thing. Why do they have it in there? Quite honestly, money. Well, some of that sorta things. Anyway, you people, US, are subject to US regulations which happens to be a three-year training requirement. Another area of confusion: Type A package. If you look at IATA, it will simply say that a Type A package must be marked Type A. If you just simply mark a USA package Type A, you're in trouble, you're you're finable. The USA package must be marked USA DOT

7A Type A. And the reason for that is you say hey, Roy, isn't this bridge from IATA to ICAO to IATA, doesn't it say that you can use the IATA as a marking alternate marking requirement? Yes, you can, but only for Parts 172 and 173. And it just so happens that the marking requirement for the Type A package happens to be in 178.350 which says that you must mark your package USA DOT 7A Type A. Also, Type A package documentation must be maintained for one year after the last shipment. You'll not find that anywhere in ICAO and IATA. And I'm going to be talking about this a little bit later on. Every time you ship a Type A package you must have in your files that you can pull out and explain to the Department of Transportation, FAA, motor carrier safety people, whoever may show up at your door, the fact that you have justifications for putting that material into a Type A package. You say well, isn't that part of the

Type A part of it? Yes. I mean the 172 and 173, it is. But the reason that it is not covered totally by the this bridge is that this is an administrative requirement. The bridge only applies to package, marking, labeling, documentation, date, that sort of thing. Those items. It doesn't have anything to do with administrative requirement. So that's why it's beyond it. That's why you have to look very carefully at the parts of these regulations as they go through it. Now, let's get started with the details of how to make some sense out of this confusion. And this applies right here, this applies not only to whether you're shipping a radioactive material package or a flammable liquid package or an explosive package or whatever, it applies to all of 'em. The first thing that you want to do is to classify that package. You wanna do this thing just like a cookbook. The next thing you want to do is to package that in order to meet your classification

requirements. Now you've got it packaged in a box or a crate or something. The next thing you want to do is to mark that package. When you mark a package you're then writing the information onto that package that is necessary to meet regulatory requirements. Then you want to label that package. OK, don't be confused between marking and labeling. When we say labeling in this context, labeling only means those labels which are recognized and defined within the regulations. In other words, a radioactive White I, a radioactive Yellow II, a radioactive Yellow III, and a cargo aircraft only. Now, your proper shipping name is a marking requirement. What is the proper shipping name? We'll get to it in a little while. As an example,

radioactive material, Type A package, UN2915. Now, that's a marking requirement but you may satisfy that marking requirement by buying from Label Master or somebody else a label which

has that printed on it. Even though you're using a label, it is not a label that is defined here on this thing. A label is only a radioactive White I, Yellow II or Yellow III, or a cargo aircraft only, that which has definition. Then we want to do the the documentation, the paperwork. We want to do the shipping papers, the declaration, whatever you wanna call it, in order to convey the proper information. One of the things, I don't remember whether I put it in the outline or not, but on your shipping papers, would you believe that even though you're required to maintain your documentation on your Type A package for one year, your declaration, your shipping papers, you must maintain not for one year, not for 365 days, but for 375 days. Now where they came up with 7 375 I don't have a clue. But it's one of these things, it's a whole lot easier just to go along and comply with it rather than fighting it. Then we talk about the placarding. The

placarding down here is going to be the fact that this is going to be these big diamond shaped things that you put on four sides of the vehicle when you are transporting one or more Yellow III labeled packages. And the last thing that we're gonna talk about, this is sort of an outline of what's coming the rest of the day, is going to be the carriage. Let's say that your job absolutely depends – let's not say your job, let's just say your next raise – absolutely depends on you getting this radioactive material package that was presented to you at 4:58 on Friday afternoon out. And FedEx has already past. Missed the pickup. Therefore, the question is can you put that radioactive material package in your VW Bug or can you put that radioactive material package in you hospital's van or can you put that radioactive material package in your friend's car and get it down to be shipped that day. We'll talk about that. The answer may surprise you

on it OK. This is where we're this is where we're headed now for for the rest of the day. Let's talk about classi oh, let me tell you what I'm going to omit today. First off, I'm going to omit any discussion because we jut don't have time, I don't think you people are concerned with it anyhow, we're going to omit discussion of physical materials. Uranium 233, 238, plutonium 239, plutonium 241, are the only currently defined physical materials. In the old regulations plutonium 238 was defined but in the new regulations plutonium 238 has been de-physialed... by definition. We're not going talk about physical excepted material. Basically when you talk about physical excepted something like when when the physial material doesn't exceed 15 grams it reverts to non-physial classification anyway. We're not going to be talking about low specific activity which may surprise most of you, simply because most people think that low

specific activity is a the greatest thing since sliced bread or whatever. But it's not. Low specific activity classification normally doesn't do you any good unless you're shipping bulk. Now I don't think many of you are going to be shipping low specific activity by bulk. So for the most part, I won't say totally but for the most part, a low specific activity classification is not going to be that that that great for you. And we're not going to be talking about surface contaminated objects. Surface contaminated objects is where you people like in the reactor, and they pull a valve or something, they clean that valve, but inside that valve there is certainly certain surface contamination that is that is still existent. So we're not gonna talk about these things. If there's some specific questions, if we have time I'll certainly take 'em. But we just don't have time to take these types of things within this. When we're talking about classification we have three

objectives We want to determine the form on the material first Then we want to determine what we're gonna call the quantity of the material And then third, we want to talk about the proper shipping name and the UN number We need all of this information in order to classify our material So let's talk about the form first of all When we talk about the form, when we're talking about the form of the material we're going to be talking about the primary containment of the radioactive material OK, let's talk about something that you people are all familiar with Let's talk about the fact that we have here this syringe vial You say well, that doesn't look like a syringe vial Yeh, it is Use your imagination, people Come on OK, this is a syringe vial containing a liter or so of say I-125 Typical glass syringe vial Alright One of things here about form here is that there's two classifications of form One's what we're going to call

special form which happens to be a performance requirement And one of the performance requirements on that is the fact that it will survive a 30-foot free drop So, what happens Let's take that syringe vial up to 30 feet, drop it on this unyielding surface What happens It's gonna break, right Alright If it happens to survive by some miracle, what if we take that syringe vial and put it into a temperature of 1475° Fahrenheit 800° Celsius for a period of ten minutes What happens to it It will melt Alright So those are two criteria there where syringe vial is not going to be meet for special form In this particular case then on the thing, let's get down to the fact that it's not special form, then we're gonna call it either other or normal form Other or normal form happens to be anything what ain't special form It's gotta be one or the other It's gonna be that simple on the thing Alright A special form, my best example of a special form is

a little antiquated but one of the best examples of special form these days happens to be the old tele old cobalt teletherapy capsule that ma many of you may be familiar with All the old cobalt teletherapy capsules were special form They would survive easily a 30-foot drop test They would survive a temperature of 1475° Fahrenheit and 800° Celsius on the thing OK Now, next thing down here we want to talk about happens to be quantity on this We got several choices as to quantity We're gonna have here a limited quantity We're gonna have a Type A quantity We're gonna have a Type B quantity We're gonna have a Type C quantity There is a highway route control quantity And there's gonna be wha a trick that happened the EPA played upon the Department of Transportation called a reportable quantity in through here So we got to consider all of these within the thing Alright We start talking about these things The... the

we start talking about these, then we're gonna be talking about certain values within these Let me say this right now Type C quantity happens to be a highway route control quantity in the air, by air transport I'll also have a surprise for you when we get a little bit later on For proper shipping name and UN number down through here, the excep excepted package, physial, non-physial, about package type number, in through here They're going to be the the three cases This is how the new proper shipping names happen to be arranged In this particular case down here, we'll be looking and we'll see how those things are broken down in a few minutes But bear those in mind from from the operation Let's first talk about, now that we have that set up, let's talk about the definition of radioactive material The old definition, there's a mistake there That is 74 becquerels per gram, that should be 70, which is approximately 2 nanocuries And

this is still valid for any radionuclide until October 1st Now effective January 25th we have two

additional things where we used to define radioactive material. One happens to be the activity concentration for exempt material in becquerels per gram. In these two tables, about 67% of the nuclei are higher than the old 70 becquerels per gram. And we have an activity limit for the exempt consignment on this. Now, the exempt consignment is going to be determined about the definition of consignment and we'll read this, the IAEA definition. Consignment means any package or packages or load of radioactive material presented by consignor for transport. Lot of interpretation there, people. The ICAO/IATA definition which is the definition that I recommended to the Department of Transportation but which they chose not to adopt. I think is a good one. But the ICAO/IATA definition is very precise. It says consignment is one or more

packages of dangerous goods accepted by an operator from one shipper at one time at one address received for in one load and moved into one consignee at one destination address. That's pretty doggone specific. That's workable. That's doable. Practical. What DOT adopted was consignment means a package or group of packages or load of radioactive material offered by a person for transport in the same shipment. That to me still begs a lot of interpretation if you really get down to splitting hairs. OK. What happens on this particular thing. Let me just give an example here of I-125. If you happen to look up in the tables the activity concentration for exempt material for I-125, you will see an entry of 2.7×10^{-8} minus 8, curies per gram. That is 27 nanocuries. And you look up the activity limit for exempt consignment and it comes out to be 2.7×10^{-5} curies, or that happens to be 27 microcuries. Now,

on this if you are shipping material, the way this works, if you have got something where your specific activity, and that means uniformly distributed, it's implied that when we talk about specific activity, that is less than 27 nanocuries per gram, and the per gram is missing, I apologize, in there, then it is not radioactive for transportation purposes. You can quit, you can stop, that's it. Let's say that you do have a concentration above 27 nanocuries per gram. If you have a concentration above 27 nanocuries per gram you got a second shot. If you're consignment then, total consignment doesn't exceed 27 microcuries, then it is not radioactive for the purpose of transportation. What this does, people, is that this for the first time gives you a legitimate way of possibly on some isotopes of maybe a small check source of being able to declare that check source is not radioactive for the purpose of transportation. In the old days

where that check source where you simply had the concentration, specific activity, there was no way it was gonna get below that. But with a consignment thing you now have a way of doing this. Alright. That's the definition of radioactive material. OK. The primary containment that we talked about before. The special form, the performance specification is the design and the test requirements, the 30-foot free drop, the temperature requirements for I say 30 minutes there, that is an error, for special form it's 10 minutes. And for a special form you may self-certify your own special form, as long as you got the documentation in your file for one year you do not need governmental authority. If you want governmental authority, then you can ship your data your information to the Department of Transportation and as a freebie they will issue to you a certificate of competent authority which is nice to have. And most manufacturers do have for

documentation on a special form certificates of competent authority. And you must maintain, if you're shipping a special form and you're using the special form classification, you must maintain your special form documentation in your files for one year after the last shipment.

Other or normal form, as I said before, is everything that is not special form. The normal form is a historical term still in wide use although some people seem to be transitioning to other. So they mean the same thing. Now, one thing that we want to do in order to determine classifications in terms of quantity, we want to associate with special form arbitrarily the term A_{sub1}. And we want to associate arbitrarily with durable other form the term A_{sub2}. Now, let me have the this little southern boy, you all, let me give you had the audacity to give you lessons in the King's English. And that lesson happens to be is that Type A and Type B are not nouns. They are

adjectives to modify certain, certain things as a quantity, a package. So I never wanna hear Type A by itself. I never wanna hear Type B by itself. I wanna hear Type A package. I wanna hear Type A quantity. I wanna hear Type B package. I wanna hear Type B quantity. And therefore we can keep from getting tongue-tied and being able to communicate effectively. Now, a Type A quantity is officially defined as the maximum activity that may be shipped in a Type A package. Big deal. And a Type B quantity is any activity above a Type A quantity. That's not too complicated, now is it. Now, let's see how sharp you people are, make sure you're awake. I know it's after lunch time and most of you have tendency to go to sleep after lunch, but this is gonna wake you up. When I say A1, I wanna hear back "special." When I say A2, I wanna hear back "normal." When I say special, I wanna hear "A1." When I say normal, I wanna hear back

"A2." Is everybody ready. No...A1 Special A2 Normal Normal A2 A2 Normal A1 Special Special A1 OK. You people get the idea. Alright. Now, in order to determine...[...somebody set the alarm off...].in order to determine whether or not we can ship something as an excepted package we look up the activity and a limited quantity has an activity of about 10 to the minus 3 or 10 to the minus 4 of it's A1 or A2 values. And so if we get a limited quantity, that's gonna be our first step... in classifying something as an accepted package. A highway route control quantity is to find as an activity where you got 3,000 times the A1 value, or 3,000 times the A2 value, or 1,000 terabecquerels which is approximately 27,000 curies, whichever happens to be the least. A Type C quantity is a highway route control quantity which is transported by air. Or a portable quantity is strictly a table lookup. This is a nasty thing which the Environmental

Protection Agency tricked poor little Department of Transportation to define hazardous substances. It's strictly a table lookup that we'll be talking about. And so when you look it up, your activity you wanna ship, you find it's either above the RQ value or below the RQ value. R the RQ has only three implications. One is a marking requirement. That's what you write on the package. Two is a shipping paper declaration entry. And three is a reportable requirement if released to the environment. Those are the three implications of RQ. Let's take some examples, hopefully practical examples. Let's talk about number one, not examples at this point. But let's talk about some difference now between your the new Title 49 and the international tables. Two main differences here. One is moly-99. For the international purposes, the IAEA and all other countries, the A2 value for moly-99 is 16 curies. As many of you know, a 20 curie moly

generator is a very popular generator to be shipped. Therefore, the US has adopted for domestic shipments only an A2 value of 20 curies for moly-99 to permit the shipment of a 20 curie model generator in a Type A package domestically. They can't do it internationally. California 252, the domestic A1 quantity is 2.7 times the A2 value, and for the A2 is I mean the A1 is 20.27 curies, A2 is the 0.27 curies or 27 millicuries. Internationally, 1.4 curies and the A2 is the old

81, is the 81 millicuries. Now, the US has been a basically a fight between the US and foreign countries over this and so the US has prevailed, or not has prevailed, but the US who has lost the battle of the international front, but for domestic issues they have kept the higher values in most of what you see here. Now, if you people want to ship something as an excepted package, this is what you have to go through. First off, determine if the radioactive material you're shipping, the

physical form. Is the physical form a solid, a liquid or a gas. That's easy. Alright. Now, also determine the form of the material, form being what. Special form. Or other or normal form. If you have a solid, the excepted factor is 10 to the minus 3. In other words, one thousandth. So the total activity you're putting into a package, solid material, is less than, it's not greater than one thousandth of the A1 or A2 value, that's going to be a limited quantity. For liquids, the limited quantity factor is 10 to the minus 4 of the A2 value. For gases, for tritium and gas, special one there, and for the special form and normal form on the gases is 10 to the minus 3. Alright. So that's the first step in determining if you can ship a radioactive material as a limited quantity. You check to see if it is a limited quantity by applying the 10 to the minus 3 factor or the 10 to the minus 4 factor. Example, 5 millicuries of I-125 as a liquid. You look up then, the

liquid says that it has normal form. Normal form means A2. A2, you look it up, it says 81 curies. You say well, heck, 5 millicuries is awfully doggone small compared to 81. Alright. And you look up also the RQ value which is 01 curies, 10 millicuries. Well, immediately we see that the 5 millicuries is below the RQ value so it's not RQ. And we also see here, that the in terms of limited quantity, if we take a liquid which is 10 to the minus 4, 10 to the minus 4 is gonna be what. 81 millicuries. So 5 millicuries is below the 81 millicuries so therefore it is a limited quantity. Another example, not very practical for you people, but 35,000 curies of cesium 137 is special form. The A1 value is 54 curies. Therefore the RQ is 1, so therefore we know at number 1 it is a reportedly it's a Type B quantity. It's above 27,000 curies so therefore it's a highway route control quantity. And RQ there is going to be up. 35,000 curies is above the 1 RQ

limit, so it's RQ, it's all of those. Again, our 5 curie moly generator, solid. A2 value is 16 curies, RQ is 100 curies. So therefore our 5 curies there is definitely a Type A quantity and it's not a thousandth or ten thousandth of the 16 curies, so therefore it is strictly a Type A quantity, not limited quantity. And the 5 curies is below the 100 curie RQ so therefore it is not RQ. This is the process that you go through for every nuclei that you want to ship in order to determine these values, whether it is a limited quantity, Type A quantity, RQ. This is information that you need to know. Alright. Some other examples. 200 millicuries of I-131 down through here. Alrighty. And I should have put out here the fact as to whether it's a liquid or a solid. In this particular case it's a solid, say. Alrighty. A2 is going to be 19 curies. RQ is going to be 10 millicuries in through there. And so our limited quantity factor is going to be for this 10 to the minus 3 in the

thing. So therefore 10 to the minus 3 of 19 curies is going to be what... 19 millicuries. 19 millicuries is below the 200 curies so therefore it is not limited quantity, it is a Type A quantity. This 200 millicuries happens to be above the 10 millicuries RQ so it's reportable quantity. 300 millicuries thallium is a solid. A2 value is 110 curies, RQ's a thousand curies on the thing. OK. If we take 110 curies, multiply it by the solid excepted package factor of 10 to the minus 3, that's going to be 110 millicuries. 110 millicuries, the 300 millicuries is above that so therefore it is not a limited quantity, it's a Type A quantity, and since the 300 millicuries is below the RQ value

of 1,000 curies, it is not RQ. In the last one, 8 curies of cobalt 60, a special form. The A1 value is 11 curies, the RQ value is 10 curies. So therefore we can quickly see that the 8 curies is below the 11 curies so therefore it is it is a Type A quantity. It's not a thousandth or ten

thousandth, it cannot be a limited quantity, and since the 8 curies is below the RQ of 10 curies, it is not RQ. Alright. Those are the examples of classifying this. Yes ma'am, yes sir, yes ma'am. [You may have said this earlier but _____ A2 quantity value _____ already know the A2 value _____]. The A2's, those are in the government publications and in your handout, I have given you the A1 and A2 tables, and also the exempt quantity and exempt concentration tables in the handouts. The handouts are on the website, you don't have 'em. Print 'em out. But you can find 'em within the regulations. Alright. We're now down for the excepted packages, proper shipping names. Two examples for an excepted package happens to be the one for limited quantity. If the limited quantity is an excepted package, limited quantity of material, UN2910. Under the new system all the old excepted packages used to be UN2910. There is now a

separate UN number for each type of excepted package. As an example, "Radioactive material, excepted package – instruments and articles" UN2911. We will talk about the instruments and articles here in a few minutes. Alright. Proper shipping names again for excepted packages, the last two. "Radioactive material, excepted package – articles manufacture from natural uranium, depleted uranium or natural thorium" UN2909. And "Radioactive material, excepted package–empty package" UN29 that should be 2908. Now, non-physical or physical excepted classifications, there are three packages, the first three listed there are low specific activity. Let's skip those very quickly. And the fourth one happens to be surface contaminated objects, we'll skip that one. The real biggy for you people is probably radioactive material, Type A package, UN2915. That's the new proper shipping name, the one that's been in use on a basis since July 1

of 2000. Most of the manufacturers have switched over to this. Mandatory is to switch over to this as of October 1. If you happen to have a Type A package, special form material, it's rare material, Type A package, special form, UN3332. If you happen to have a Type BU package where U stands for unilateral approval, unilateral implying that it does not need the prior approval of every country it goes to or through, it's a rare material Type BU package, UN2916. For a Type BM package, M means multilateral. Multilateral is where the prior approval is required of every country that it goes to or through, that's UN2917. Alright. We're down to material Type C package is a 3323. Guess what, people. To my best knowledge there does not exist anywhere a Type C package, and to my best knowledge I don't know of anybody planning to design a Type C package. That means such things as a cobalt 60 for the sterilizers and the

radiators now are being shipped by vessel and by highway rather than by air. Another one where we got material transported under special arrangement, UN2918. And for the hexafluoride, uranium hexafluoride corrosive, UN2978. For those of you that have been shipping for awhile, you notice that the old NOS, not otherwise specified, is no longer with us, thank goodness. Package. These are the package choices. An excepted package. Above that in order of complexity, industrial package. Then you have your Type A package. Then you have your Type BU package. Then you have your Type BM package. Then you have your nonexistent fictitious Type C package. An excepted package that we talked about. The old terminology used to be

that an excepted package was a strong type package. Two years ago they got more explicit. An excepted package must meet the general package design requirements, that's Section 173.410. A

maximum surface reading level on excepted package must not exceed 5 millirem per hour. There used to be what was called an excepted package notice that had to be inside, on or with the package. That's no longer with us. Now for the US you park the UN number on the package. Currently IATA also requires the proper shipping name. IATA is going to reverse themselves in about a year or two and remove the proper shipping name requirement. Let's give an example. Go through the arithmetic. Let's give an example of this. Let's do our shipment of 5 millicuries of I-125 as a liquid. Liquid implies A2. A2 value for I-125 is 81 curies and the RQ value is 0.1 curies or 10 millicuries. The limited quantity factor for a liquid is 10 to the minus 4 of the A2, and that becomes 8.1 millicuries. So then the 5 millicuries is a limited quantity. The package must meet the general design requirements. The inner package must be marked radioactive.

That can be as fancy as your laboratory, where you got the material, yellow and magenta with a tree foil on it. Or it can be as crude as a magic marker which says radioactive. The maximum surface reading on that package must not exceed 5 millirem per hour. You must mark the package UN2910 on the outside. At this point you have satisfied all of the domestic US Title 49 requirements. In order to keep IATA happy, in particular if you're shipping internationally, you ought to mark the package with the proper shipping name and UN number. In other words, "Radioactive material, excepted package – limited quantity of material, UN2910." You also want to put the same information onto your air bill. Not a candy-striped declaration but the air bill. "Radioactive material, excepted package – limited quantity of material, UN2910." And that satisfies the IATA requirement. At this point shipping an excepted package, people, you're

through. That's all there are to it. That's the total procedure. Let's take example here of a instrument or article, UN2911. First off, what is an instrument or article. Radioactive material which is an integral part of an instrument or article and which requires disassembly or destructive means to get to the radioactive material. The maximum radiation level from an instrument or article is at 10 cm, 4 inches, must not exceed 10 millirem per hour. Alright. Remember, we had this table. Oh, excuse me, we had a similar table for limited quantity. This is the table for instruments or articles. We have an item limit, each item. For example, a luminous dial watch would be an article. Alrighty. So with each luminous dial watch we should not have activity which exceeds that in the item column here. If we can meet the other requirements, it would be permissible to put up to this amount in a single package in the package column. An

example to bring this home hopefully. Let's take 100 millicuries of cesium 137, special form in a portable instrument. The maximum radiation level on that must be less than 10 millirem per hour at 10 cm, 4 inches from the instrument surface. Cesium 137 special form is an A1. A1 value is 54 curies, RQ value is 1 curie. The instrument excepted package factor is 10 to the minus 2 of the A1, 10 to the minus 2 of 54 curies happens to be 540 millicuries. So 100 millicuries will satisfy the item limit. The maximum number of items in the package, we can put up to 54 curies in that shipment, so theoretically we could get 540 of these instruments placed into one package provided we could keep the surface radiation level to 5 millirem per hour which is probably not very practical in this particular case. But if you're doing something like tritium on a dial face it could be possible. The package again must meet the general design

requirements. It just must be marked radioactive. The maximum surface radium must not exceed 5 millirem per hour. We must mark the package UN2911, and at this point we have satisfied Title 49 US domestic requirements. To satisfy IATA, we must mark the package with the proper shipping name and UN number. Radioactive material, excepted package. We don't have to put instrument and articles, we can editorialize this. If this is an instrument, we put instrument. If this is an article, we put article. Then the number, UN number, UN2911. And again the proper shipping name may be removed by IATA next year. And we do the same thing somewhere on the air bill, an air bill entry giving the same proper shipping name and UN number. At this point we have now satisfied the IATA requirements which means you're good to go even if it's international shipments, and that's it. Those give you two examples of how

easy it is to ship a limited quantity or instrument or article as an excepted package. Those are the total requirements. Also, I always get the question, because this is an excepted package does that mean that it is not a radioactive material package. Well, even though it's excepted it just means that it's excepted from certain things. It is still a classified radioactive material, therefore the shipper is still subject to the trading requirements. Alright. Let me throw you a curve. What happens if we happen to have a limited quantity where we are excepted from the declaration but we also happen it also happens to be a hazardous substance which is a defined RQ or reportable quantity. Alright. In this particular case we have to have a so-called modified shipping paper or dangerous goods declaration. On that we must put the following: RQ, and I strongly recommend that you put it up front, radioactive material, excepted package – limited quantity of

material, UN2910. You must also put your merchant's 24-hour telephone number, first time I've talked about it but we'll talk about it more later. And this shipment is excepted for passenger-carrying aircraft but it is not required to put the medical or research certification statement. You are required to sign a general package certification statement on the shipping paper or the declaration. So, if it's a limited quantity, RQ, a little bit more. For second completeness of industrial package, they are for low specific activity and surface contaminated objects only. There are three flavored, so-called IP1, IP2 and IP3. Big deal. Type A package. Now I'm going to shock probably a number of you because the biggest powers that exist in this area has been in the medical community. And that is because the medical community over the years, you receive on a daily, weekly basis all these nice cardboard packages coming in from

BMS, Mali _____, ICN and whoever, that says USA DOT 7A Type A. You take these packages, many of you have in the past. You see these packages and you store them away in a storage closet thinking that hey, look, I want. I have to ship things occasionally and when I ship something I got me a Type A package. People, you don't have a thing. It already says USA DOT 7A Type A. Why. The only way you can use that package to ship is to have the documentation on that package from the manufacturer or the shipper of that package and you prepare that package in the same way. The problem is, is that is the manufacturer going to give you this package documentation on that package. I can tell you right now from experience the answer is no. Why no. The lawyers are involved. Because it then becomes a liability issue to that manufacturer. Yes sir I received a _____ generator, ___ sources from _____ and there

was a kit of paperwork to attach to the box and put the old stencils back in to return and there

was never documentation Type A, but it happens every every month with us Well, you are potentially liable I understand what you're saying but that manufacturer is obligated to give you because you must maintain in your files for one year after your last shipment that documentation I can tell you the chances of getting caught on that are very slim or rare unless there that package is involved in an incident or something at the current time But that's it So just because you have this, I wished I had time 'cause I intend to make this part of my current presentation, I want to get to this point Several months ago I had a prime example At the FedEx Los Angeles facility, staff out there found a nice identifiable lead paint Well, they called and I was able to identify where the paint was probably going and called the recipient which

happened to be the manufacturer going back and they said hey, we got the box but he says nothing was wrong with it He called me back a while later and he said we just looked at the box There's a hole in it Well, what happened was the thing had just the shipper who shall remain anonymous for obvious reasons, had taken his little package out of the storeroom and decided he had to get this paint back to this other guy Took this box, threw in a few foam peanuts, dropped the Lawrence paint in, taped it up and shipped it Now, when that box came in to that facility, it was a box where you had solid styrofoam with a cavity for the paint Alright FedEx and other carriers has the world's best package testing system with our belts and our slides on the thing And I can attest to the fact that Newton's laws of motion still apply And that is an object that is in motion will tend to remain in motion until acted on by an external force What One of the

primary laws of motion This particular case, this thing was going down and the there was enough momentum in that paint, it went right through the side of that box just like a projectile, perfect hole There was it was about this diameter incidentally The circular part of it came up in that there was flap on it, the it created a little flap on the cardboard And that flap had gotten pushed back down and so unless you looked at it you wouldn't have known that the hole was there And I have a picture of that paint in that hole Perfect fit That's the reason for these sort of things Alright Now, you say well, Roy, where can I buy a Type A package With one exception, you cannot buy an off-the-shelf Type A package, ladies and gentlemen, anywhere to my best knowledge And I'd be more than willing to eat my words at some point if I am proven otherwise, but over the years I have not been You cannot buy an off-the-shelf Type A package,

with exception of the PET and NET fluorine-18 packaging system and that is an off-the-shelf Type A package for a fluorine-18 only Alright Next thing is you say well, I'll design a package and have it tested Good luck There is no testing company, package testing company, that can give you full documentation necessary on your Type A package I know some of you are gonna say well, I have seen on the web and other places people advertising selling me Type A package You have to look carefully What they're selling you people are the components of a Type A package They're not providing you the total documentation that would satisfy the regulatory authorities The proof is in the pudding I can certainly go where I can buy you, I can buy a 10-gallon 1A2 drum, I can buy you some solid styrofoam, and I can sell that to you as a Type A package But I can only sell it to you as a Type A package if I provide all of the

documentation That's what these people are doing though, and they will say here these are the components of a Type A package But to be honest with you, anything can be a component of a Type A package, depends on what you wanna put into it sorta thing So... anyway, you say well,

Roy, are you going to leave me hanging as to how do I ship my Type A quantity if I can either, number one, not buy a Type A package off the shelf; or number two, have a testing company test it. My best advice to you people, I've given this quite a bit and it works, is that if you're associated with a university, if you're a medical school or university or a place like that, you got it easy. Pick up the telephone, call the engineering department, say hey, engineers, would you like a great senior project. What you're gonna find is the engineer department is going to gobble this up because they've been designing concrete boats and now they can get into something

practical and useful. And this is an ideal situation for a senior project at any engineering college anywhere. They would dearly love it. 30-foot drop test, most vulnerable positions, great engineering, any senior year can do. They can read the book, quick disconnects. They can design the pad that's the movable object sorta thing. They can take the video of the test, they can write the reports and document it. How about doing the 2" per hour rain fall. Man, they love that one. What do you do. You go out, you buy you some lumber at Home Depot, you go down and buy you four showerheads, you mount the four showerheads up here and you calibrate, which is the engineering part of this, to get you 2" per hour. Great senior engineering project they would dearly love. Alright. So you're not part of a medical school or something like that. OK. Call up the controller of your company. Say do I have a deal for you. The deal for you is

this, that if you can talk that controller into giving a grant which is tax deductible now, to your local engineering firm and you'll get all this great publicity for supporting education and you get a Type A package documentation in return. Controllers love it. The end result is do it yourself. It ain't that big of a deal. But do it to design, do it yourself. Alright. Many shippers think that the test only required for Type A package documentation. Wow. Also, what's the criteria within this for the Type A package that there is no loss or dispersal of radioactive material. Well, to be quite honest with you, any package testing company can do that, no problem, because they'll use something like fluorescein to simulate the radioactive material which is easily detectable under a black light for the loss or dispersal. So you can do that. The problem is, is that there is the second criteria is that there be no loss of shielding integrity which would result in a more than

20% increase in the radiation level at any external surface of the package. This is what they can't do. Number one is that they can calculate it but they don't have the expertise to do so and it becomes a hell-of-a-lation calculation. It's not very practical. So the way to do it is actually to put radioactive material in the package, subject the package to the test and measure it. But there's no testing company that's got a radioactive material license to do that. Those are the reasons. What constitutes Type A package documentation. It should be in your file. One, it should be everything under 173, that should be a 410, general design requirements. It should be everything that's listed in 173.412, additional design requirements for Type A package. The package test and the results are supplied in 173.465, and if it's for a liquid or gas, the additional test is in 466. Now, in this business, ladies and gentlemen, there is no style points. Like in

dieting. When I tried to help people in this area, a lot of people had the tendency that they go into say hey, look, we're gonna be original about this and rewrite it. Forget it. Take the regulations, take every point down there, write it and give your answer to it as part of your documentation. Don't be fancy. Some of the answers are going to be not applicable. Well, not applicable is a damn good answer. Alright. If you want more information on Type A package,

package documentation, a great website is www.rampac.com, for radioactive material packaging. This is a website which is operated by a contractor for the Department of Energy. It's got a bunch of nice valuable information on there, including some of the documentation that's used by DOE for some of their packages and stuff. It's also got a list of all the Type B packages, it's got a list of all the special forms certificates. It's a nice nice website. As I said before, you're

required to maintain on file for one year after the last shipment complete documentation of the test, an engineering or engineering valuation or comparative data showing that the construction methods, packaging design and materials of construction comply. 173.350 requires that you mark the package USA DOT 7A Type A. Type A under inter Type A, you will find that in IATA and IAEA refers to a VFR code. A VFR code is a vehicle registration identification which a lot of people get confused by. The VFR code happens to be USA. The VFR code for France, guess what, is FR. The VFR code for Great Britain, guess what, is UK. Big deal. Also, the name of the manufacturer or other identification of the packaging specified by the competent authority. In other words, if you're the person that says that this is a USA DOT 7A Type A package, you must be identified on there. Type A packages that are manufactured in the US

must be part Type A with the country of the origin on there. As I said before, the Type BU package, U stands for unilateral, unilateral approval is not recognized by the US, Canada, Denmark and Japan. If there's a UN if there's a BU package being imported into this country, before it gets here it must be revalidated by the Department of Transportation. Competent authority approval required. The US Nuclear Regulatory Commission which is evaluating US Type B packages will issue a so-called certificate of compliance. This is good for domestic shipments. Once a manufacturer gets a certificate of compliance, he packages that up, sends it over to the DOT and they issue a DOT certificate of competent authority. Let me shock you just a little bit. Any of you care to guess as to what the Nuclear Regulatory Commission would charge to evaluate a BU package which weighs say, approximately 50 pounds, shielding

depleting uranium, depleting uranium is titanium or stainless steel encased, with a maximum activity for say, maybe 100 curies of uranium 192. Any of you care to put a dollar figure on what the Nuclear Regulatory Commission charges just to evaluate such a Type B package. Any of you brave enough...[audience comment]...A hundred and fifty thousand...[...I was close...]...Alright. A hundred and fifty thousand bucks, ladies and gentlemen. That doesn't include the design cost, that doesn't include the prototype testing, the whole bit. Just the check that the company writes to get the certificate of compliance. A BM package, M stands for multilateral approval, means that competent authority approval is required for every country whose code is 2 or 3. When you're dealing with a Type BU BM or BU package, a user – you're the user – must register with the Nuclear Regulatory Commission. That's a freebie, believe it or

not. So if you're using, if you're gonna be shipping back a Type BU package, you must register as a user, you must have the Type B BU package, BU package documentation in hand, and prepared in accordance with that documentation. A Type C package for the information, is a highway route control quantity in air, and as I have said, there's no Type C package in existence or plan to my best knowledge. Marking. Do not confuse, as I said before, a physical label with a label requirement for transportation. A label, as I said before, is only a radioactive White I, Yellow II, Yellow III, cargo aircraft only for radioactive materials. A marking may be

handwritten according to regulations. A marking has to be proper shipping name and UN number. From the marking you omit the class 7 number for radioactive on the marking. You put in on the shipping paper but the 7 doesn't go on the package marking. The 7, for your

information, is at the bottom apex of your White I, Yellow II, Yellow III label. The package specification must be also part of your package marking, such as USA DOT 7A Type A, or for Type B package, something like a USA/999/BU-96. Your package, radioactive material package are over packed, if the gross weight is greater than 50 kilograms, 110 pounds, you must put your gross weight, mark your gross weight on the package. The consignee or consignor's name and address is part of a marking requirement. For US shippers, orientation arrows on opposite sides for liquids is a requirement for radioactive material. IATA does not require, IATA/ICAO does not require orientation arrows for radioactive material. The labels: Three labels: Radioactive White I, Radioactive Yellow II, Radioactive Yellow III, and cargo aircraft only. Your category labels, White I, Yellow II, Yellow III, are solely dependent on the external radiation level at or

measured from the surface of the package. Let's define transport index. Transport index is a unitless, dimensionless, pure number, which is the numerical equivalent to the maximum radiation level measured in millirem per hour at one meter from the surface of the package rounded up to the nearest tenth. So if you think that your survey meter and eyeball are that highly calibrated and you happen to read a radiation level at 1 meter from the surface of the package of 2.71 mr per hour, then your transport index is 2.8. Notice it's rounded up. Zero TI has to have a special definition simply because we cannot use the rounded up bit because theoretically even though one survey meter might read zero at one meter, we could get a more sensitive meter that will read something. If we read something then we gotta round it up to the nearest tenth, that doesn't work. So zero TI is defined specially. It's the maximum radiation

level at one meter, at millirem. No. At one meter from the surface of the package that does not exceed 0.5 millirem per hour or 50 microrem per hour. That's a zero TI. Now, most of you have seen these, familiar with them. The maximum surface reading for a White I must not exceed 5 millirem per hour, and the transport index must be zero. In other words, not greater than 50 microrem per hour. A Yellow II, surface must not exceed 50 millirem per hour, transport index must not exceed 1.0 millirem per hour. Now, a Yellow III label, ladies and gentlemen, is anything in excess of a Yellow II. The reason that you see 200 maximum at the surface in a maximum of a 10 transport index, those are the limits for non-exclusive use. In other words, if you're offering the package to Fed Ex, unless you want to charter a FedEx truck or an airplane, then that becomes non-exclusive use and so those limits apply. The category of the labels, there

is a blank on your White I and Yellow II that says contents. So you put down there the nuclides. And the typical symbols in mass numbers are permitted, and in case you have a mixture or a bunch of things in there, you're supposed to use 95%, if space permits, of those radionuclide based upon the activity Type A ratio for each nuclide. You put your activity for each nuclei divided by its Type A quantity, activity for the next nuclei divided by its Type A quantity, and the idea is that you must include 95%. If you can't include 95%, put them in decreasing order and put as many in decreasing order as you can. Activity units must be in becquerels. Curie units no longer permitted in transportation. For mixtures, you put the total activity of a mixture

If you have individual nucleus in the same package, then you put the individual activities for each nuclei For a Yellow II and Yellow III label, you put the transport index Two radioactive

material labels are required on a package when shipping radioactive materials Do any of you happen to know if you were shipping a flammable liquid how many flammable liquid labels you would be required to put on there ...One If you're shipping an explosive, how many explosive labels would you be required to put on there ...One If you're shipping a corrosive, how many corrosive labels would you be required to put on a on a corrosive package Alright If you and I went to Baghdad on the Potomac, in other words, Washington, and we went to the Department of Transportation, and we looked up the safety record for all the hazard classes, which hazard class do you people think has the best safety record ...[audience comment]...Which one ...[Radioactive...]...Radioactive way by far than any of the others [...Congratulations...] Alright Precisely my point I think we can do the country a great service if we petition DOT to

require two labels for flammable liquids, corrosives or all the others , don't you ...[Yes yes...]...OK, I'm glad we're in agreement on that one Zero TI is a valid transport index for a Yellow II label package So don't be surprised by something like that If you happen to have a radioactive material that is also a flammable liquid, then the flammable liquid is a so-called subsidiary risk and you must put a flammable liquid label on there So even though if you were shipping flammable liquid by itself you would only have one label If you're shipping it as a subsidiary risk to radioactive materials, you'll have to have two flammable liquid labels because there's one rule that says that any subsidiary labels must be adjacent to the primary label So there are two primary labels, then you have to have two subsidiary labels nest to them And two cargo aircraft only labels, if it is not medical or research and the TI is greater than 3 Shipping

papers First thing on the shipping paper that you wanna put is RQ if it is applicable That's Parker's rule The reason for that is that the RQ may either go before the proper shipping name and number sequence, or it may go afterwards If you put it after, which means you put it after the UN number, then if you're using one of these addendumable able IATA columnized forms, then that throws the RQ into the UN number column When you put the RQ in the UN number column you have confused the troops, ladies and gentlemen And if you're shipping radioactive materials or any other things the primary rule is don't confuse the troops Because if you confuse the troops your package may not get through when you want it to So the easy way to stay out of this confusion is to put the RQ up front Then you put the proper shipping name, radioactive material, Type A package, class number 7, and its UN number Next is the

radionuclide I-125 And if it is not a special form, put the chemical and physical form Physical form is easy, solid, liquid, gas Chemical form you can be just about as generic as you want to be and nobody's gonna give you a hassle on it If you wanna be explicit and you have got in there sodium iodide for I-125 and you wanna put sodium iodide as being very explicit, nobody's gonna argue with you If you want to understand that sodium iodide is by the chemist classified as a salt, you may put solid salt So you may be as generic as wish, and I can just about attest to you that nobody's gonna give you trouble If it is a special form, then you omit the physical and chemical form as long as the special form is identified The activity must be in becquerel units If you're a diehard and you want your curie units up there, fine Just put your curie units after the becquerel units in parenthesis That becomes additional non-conflicting

information Next, transport index In the radioactive category label, TI equals 1 1, Radioactive Yellow III Do not abbreviate YIII, that's final If it's a Type B package, put your Type B package certificate number If it's special form and you happen to have your special form certificate competent authority, put it down Domestic shipments, FedEx does not require you to attach your Type B or special form documentation International shipments, yes If it's cargo aircraft only, so indicate And put your 24-hour telephone number That is your shipping information declaration by Title 49 Nor you have to certify stuff This is the general package certification It does not have to be these exact words This is to certify that the above-named materials are properly classified, described, packaged, marked and labeled in the proper condition for transportation according to applicable regulations of the Department of

Transportation General certification If it is for medical or research purposes and you have it classified for passenger aircraft, you must certify it This shipment contains radioactive material intended for use in or incident to research and medical diagnosis or treatment And also for this the TI must not be greater than 3 0 If it's an air shipment, you have to certify it basically that it is an air shipment This shipment is within the limitations prescribed for passenger aircraft or cargo aircraft only, and you delete the one which is not applicable And you have to sign all these certifications One signature is fine Title 49 permits printed or mechanical signatures Now,...yes sir, I'm sorry If you receive something and it's certified medical use and then it's actually _____ returning it, you can't take advantage _____, you have to call waste management... No... No, believe it or not, there is also a written interpretation on this and if the

original thing was medical and even though you're returning it, it is still medical And there is a written interpretation within the Department of Transportation on that fact I'm told even in the past couple months that _____ you cannot take advantage of _____ return is reclassified as waste material... Read the interpretation, it's there Yes sir We talked about this a little bit at ACMP last month and they said that the phone number that typically comes on the sheet on the display there does not necessarily cover us because that phone number comes from the recipient, not the shipper Number one, FedEx does not put a telephone number down there [Well, we get it pre-filled out]... I'll talk about that, it is correct A lot of people, for example, if you're returning shipments, particularly betatherapy type of shipments, they have a telephone number down there, particularly ChemTrek Let's say that the betatherapy company has a contract with ChemTrek

OK They used to not pay attention to this, but then ChemTrek found out that the return shippers were also using that number And so ChemTrek happened to see dollar signs and ChemTrek came back and said hey, we're going to require they only want to permit the emergency telephone number by those that have contracted with us Now if you're betatherapy company, as an example, has contracted with ChemTrek to permit the return use shippers on there for which they pay, then it is permissible But otherwise it is not So I have to check that...Yes OK Yes sir, I'm sorry Is it permissible or is it required that these be typed, or otherwise mechanically written out, or can those forms be filled out by hand ... I have, too, but I.....Alright, let's talk about FedEx again And I, even though I'm a consultant to FedEx, I'm not here today representing them but in this case I will I will read to you the excerpt [audience comment]I

don't think it's necessary Alright This happens to be found in IATA, it's usually your best

place, and in IATA it is on which is called FX-12 variation Shippers declarations must be typewritten or computer generated Handwritten forms will not be accepted Exception – non-radioactive shipments may have the name and address of the shipper and consignee, airway bill number, airport of departure and destination, RQ, technical name, number of packages, quantity, unit of measure, name, title, signature and place/date entered by hand on the declaration [audience comment]Patience Radioactive material shipments may also, i e , in addition, have entered by hand the activity, category, White I, Yellow II, Yellow III, TI and dimensions by hand You say well, hell, Parker, what's left What's left is, guess what Proper shipping name, class and UN number That's what required to be printed Answer your question

...[Yes...].OK OK This is the famous candy-striped peppermint IATA declaration form There is no regulation anywhere that says you must use a candy-striped declaration form But...I will give you a piece of advice If you are shipping internationally, international countries expect it, therefore use it If you're airlining, use it In general, it's better just to go ahead and use it than fight it on the thing Now, one thing is I don't like that columnized form It looks great, but have you people ever tried to type or program a format a computer and put the information in those dammed columns and have them fit It becomes "mission impossible" Alright In any rate, I am going to give you an alternative to this That is the famous form there Actually this again is a Fed Ex policy, all the other policies, realities There are actually some cases where I can give you all sort of examples, where particularly on automated systems the

candy-striped form is not used, particular for domestic shipments Let's talk about how you complete the information Yes, sir, I am sorry Audience:-----Make a note as to FX12, and talk to the, show the guys at Fed Ex or whoever else that particular thing because that is the written policy, that is In other words they heard, look declarations have to be typed, you think it is all inclusive, but your salvation is to show them, and you can always call up the Fed Ex station and talk to, always ask to talk to the Fed Ex station and call up and have them put you in contact with the local Fed Ex station and ask for the so-called ops manager, ops meaning operations I am absolutely certain One reason is I am, you are looking at the guy that got most of those exceptions put in there Because I do a lot of shipment from the field Hell, I knew what I could have typed in the field and what I can't Alright How to fill these things out,

transport details Now I want you to know here, under transport details, if you remember back to that form, the shipment is with the limitations prescribed for you and the passenger and cargo aircraft and you cross out either one that is not applicable Shipment type is easy, non-radioactive, radioactive, block up there for that Nature and quantity of dangerous goods, that is the first big headings So you put RQ, you put your proper shipping name and you put your class number, you put your UN number, you put your packing group, and that is not applicable unless you have a subsidiary risk for radioactives You put your subsidiary risk, which again is not applicable unless you have a subsidiary risk Then under quantity and type of packaging, we are going to nuclearize an activity if multiple nuclearize the same package Special form, or physical or chemical form, that must be specified The packaging type times the activity for signal

nuclearize for each one of them, or the mixture total If multiple nuclearize in the same package, you put all packed in one If overpacked used, put overpacked used Under the package instruction columns, the radioactive category label, white I, yellow II, yellow III, the transport

index for yellow II's and yellow III's In the package dimension in metric units, normally cms On the authorization column, your type B, your special form, certificate of compliance number, if such exists, required for domestic shipments and your type B package number for your type B package Under additional handling information if it is not out of the block, 24-hour emergency telephone number, if there is not a separate certification statement, your medical and research certification statement, and a statement that if you wish if you are shipping internationally, you may include a statement that this shipment may be carried on passenger aircraft outside US

jurisdiction Your basic certification statement, which is the one printed on all the auto forms, now This is the form that I recommend Many people don't know of its existence, but it exists This is so-called free form and life is much easier with a free form than trying to cram things into those dammed columns, believe me The rules on the free form are simple: Each main heading that I talked about before has to begin a new line, that is it It is easy Therefore, the ah, let me get back Signature block, alterations, something got out of hand there Anyway, back on the columnized form, the signature block, if you have an alteration down there, it must be cross out and use the same signature underlined Okay, the free form there is the fact that the dangerous goods information, the quantity and type of packaging, packing instructions and authorization, must each begin on a new line Alright Pardon Free form, you can buy them

from Label Master, places like that, also again, even though I am not here representing Fed Ex, you can go to the Fed Ex web site, you can download either the columnized form or the free form and you can download, they are interactive, you can download them either way You can download them so that if you have a color printer it does that, or you can download them in the black and white version, if you have already got your candy red and white stripes preprinted somewhere So they are readily available Tell you what, people my clock on my arm here says it is about time for the break, the break says about 3:20 to 4:00 This has been a good crew on it I know it's not the most exciting session for you Come back, we'll finish it up There are a number of other interesting things when you come back