SUMMARY OF SUBMISSIONS AND RESPONSES
DRAFT SAFETY GUIDE SAFE TRANSPORT OF RADIOACTIVE MATERIAL

SUBMITTER	COMMENT	RESPONSE
01 Anthony O'Brien Radiation Professionals	I am very interested in the interpretations of Natural uranium and uranium in secular equilibrium. Line 2119 to 2124 states that there is an inconsistency in the definition of natural uranium. I would like to suggest that there is not an inconsistency. There is a definition of Natural Uranium. Why not for Natural Thorium? If the purpose of the definition is to denote the chemical separation of the Uranium, then it would follow that Natural Thorium is separated Thorium - but this is just Th232 and there is already a line in table 1 for that, so why have a second line for Th(nat)? Is it more likely that the wording of the code is correct and that the definition for Natural Uranium is there to denote the natural isotopic ratios, not the chemical separation? The reason for having a definition for Natural Uranium would seem to be that it can be in equilibrium or separated (hence the use of the term 'may'), but importantly is still in its natural isotopic ratios (something that is not an issue for Natural Thorium, hence there is no definition for it.) Also why have some of the values on the same line in the table been denoted for separated U and Th and others for U and Th in equilibrium? The fact that the exempt limits are clearly (line 2136 to 2138) for “ores and concentrates” (ie uranium which <u>may</u> be chemically separated) would suggest that such an interpretation would apply to the A_1 and A_2 values as well. With this interpretation then the definition of Natural Uranium and the use of U(nat) are entirely consistent. However the issue does seem to be clouded in para226 in the code “LSA material shall be in one of three groups:	It is reasonable to assume that, unless otherwise defined: • Enriched, depleted or natural uranium applies to uranium that has, respectively, been enriched, depleted, or neither; and • "U(nat)" (or U-nat") would be an abbreviation of "natural uranium". Any deviation from these ideas is therefore bound to result in confusion, and this appears to be what has happened in the IAEA Transport Regulations (and therefore the Transport Code). The issue has become confused in the IAEA Transport Regulations through the IAEA: (a) saying that "natural uranium" might not be separated from its decay products, and (b) giving values for U(nat) that clearly refer to U+ all decay products. It is therefore possible to construct an interpretation where the Transport Code hangs together, but it is not clear, and may be inconsistent with other publications such as the IAEA Basic Safety Standards.

	(a) LSA-I (i) Uranium and thorium ores and concentrates of such ores, and other ores containing naturally occurring radionuclides which are intended to be processed for the use of these radionuclides; (ii) Natural uranium, depleted uranium, natural thorium or their compounds or mixtures, providing they are unirradiated and in solid or liquid form; (iii) Radioactive material for which the A2 value is unlimited, excluding fissile material in quantities not excepted under para. 672; or (iv) Other radioactive material in which the activity is distributed throughout and the estimated average specific activity does not exceed 30 times the values for activity concentration specified in paras 401–406, excluding fissile material in quantities not excepted under para. 672." This does suggest that 'uranium and thorium ores and their concentrates' (ie chemically separated) and 'natural uranium' and 'natural thorium' are different, however note the use of the term "intended to be processed for use of these radionuclides". If they are not intended to be processed for use, then with the interpretation of the meaning of 'natural uranium' just put forward, it would make sense to have the extra line, and hence there is no real discrepancy. There are real ramifications of determining the interpretation to be used. If the definition just put forward is used, then any amount and concentration of uranium and thorium ores can be transported as an excepted package (providing the radiation levels on the surface are below 5μSv/hr and the other general requirements) as the A_2 value for natural uranium is unlimited. However if the correct interpretation is that put forward in the "SAFETY GUIDE Safe Transport of Radioactive Material 2008" then the A_2 value for uranium and its progeny and thorium and its progeny are about 4.3GBq and 1.4GBq respectively. The limit for excepted packages being $10^{-3}A_2$, this equates to no more than 25g of uranium or 35g of thorium. Therefore an ore of 760ppmU (or 2400ppmTh) is exempt from the code, so as many tonne as desired can be transported, while the code applies to an ore of 780ppmU (or 2600ppmTh), which means a maximum package size of 32 (or 45) Kg for an excepted package!	

	This would seem inconsistent to me and may cause serious considerations for the mineral sands industry as transport of radioactive material in waste residues (currently carried out in tankers and such) may require industrial type packages. Could you please comment on the above?	
02 Cameron Jeffries Scientist Radiation Protection Division Environment Protection Authority South Australia	**Comments Draft Safety Guide for the Safe Transport of Radioactive Material 2008** **Lines 130, 131** According to Schedule 3 the package should also be labelled with the UN number (UN2909) **Lines 294, 295** The meaning of "see item 6 of paragraph 59" is not clear. Paragraph 59 in the safety guide does not have an item 6. There is no paragraph 59 in the Transport code **Lines 376 - 386** It is correct that vehicles transporting Cat II and Cat III packages require placards. However, placards are also required for Category I packages according to para 571 of the Transport Code. This information should also be provided in this section of the Safety Guide. **General comment** The Safety Guide should become a very important document and ARPANSA should be congratulated for taking the time to produce this guidance.	 Done. The bracketed reference has been removed. Done. Noted.
03 J.L. Symonds (in consultation with Mr Graham Owen)	In consultation with Mr Graham Owen of Toll Project Services (formerly Brambles Project Services and then Patrick Project Services), I submit the attached document for ARPANSA consideration. My involvement with the transport of radioactive substances has extended over many years, both directly and as a consultant to Mr Owen and other companies and organisations, in such matters as: • The removal of plutonium material in drums from the former British Atomic Test site at Maralinga SA, insertion in secure containers and their transport to the UK by aircraft, under agreement with the Australian Safeguards Office (now ASNO), other Commonwealth authorities and SA Government authorities.	 Noted.

	• The transport and shipment of yellowcake overseas from mines in the Northern Territory, South Australia and Queensland through ports in Adelaide suburbs, Darwin and Sydney. • Transport of Commonwealth-owned reserve stock of yellowcake from ANSTO to Sydney port by road and overseas by marine transport. • Loading and transport of ANSTO spent fuel by road several times from ANSTO to Sydney ports and thence by ship overseas to the UK, Europe and the USA, by routes such as around South Africa to the USA or Europe, or via the Panama Canal to the USA or Europe • Containment, loading and transport of CSIR radioactive waste stored on ANSTO property, originally from dismantled treatment works in Victoria, through NSW and SA to Woomera in SA. • Removal of radioactive waste products of biological research work from a cemetery location at a CSIR research centre south of Adelaide SA to a secure storage by road to the north of Adelaide, agreed with SA regulatory authorities. • Movement of radioactive substances for research and treatment of patients at a Sydney hospital, by air from a location in Europe to Sydney airport and then by road to the hospital. • Movement of new reactor nuclear fuel from overseas sources by air to Sydney airport and thence by road to ANSTO. • Receipt and/or return of B(U) flasks used in the transport of spent fuel or delivered new fuel. These operations have included consultations with and approvals from regulatory authorities (and later Competent Authorities when so formed), under the IAEA Transport Code as it went through development and changes, and finally under the Australian Safe Transport Code. Consultations with AMSA, CASA and international authorities such as IAEA and IMO have taken place over many years. **Attachment** **Submission on Draft Safety Guide RPS2.1** **From J.L. Symonds (in consultation with Mr Graham Owen)** Where possible, these comments are made within the headings for each Chapter of the Draft Safety Guide. Where they cover more than	

	one Chapter, this difference will be noted. **Chapter 1. Introduction** Para. 6: It is not clear why the added sentence under "the Carrier" is added when there is no equivalent sentence under "the Consignor (shipper)", yet there are certainly likely authorisations from regulatory authorities for both Consignor and Carrier in each Australian jurisdiction. It would seem appropriate to place such an advisory warning elsewhere in the Safety Guide. **Chapter 2. Notes for Consignors (shipper or sender)** Para. 9: The Consignor's Declaration is sometimes called the Shipper's Certificate and that is not mentioned except in passing (para. 65). Unfortunately carriers often call it the DG Certificate (DG=Dangerous Goods) and that has continued even now. If the Shipper's Certificate style is to be mentioned, it should be here in para 9 and not in para 65. Paras 12: This is a useful note as interpretation has been rather difficult. Editing note: should read "… **an** inconsistency…" in line 2! **Examples – Pages 5-12** There is a possible problem with the wording of the documentation required in Examples 2-5. Copies of the Consignor's Declaration must be provided at each transfer point, whether it occurs at one for land, sea or air transfer. A copy of the declaration is retained at each transfer point when it is essential (from aspects such as confirmation of transfer, insurance and so on) that the documents are signed off on transfer after making sure that everything is properly checked. No mention of signing off appears in the Safety Guide. In fact, in bottom right of the table on page 7, it only notes that "it **may be** necessary for each such carrier to receive a copy of the Consignor's Declaration". Similar wording appears in Step g on page 9. Example 5 on page 11 has no mention of the documents required for transport, except to mention the Transport Code and the IMDG Code and the Australian Supplement in Step c. Is that an oversight or is it	A variation of the statement has been added to the consignor and consignee. Paragraph 9 has been amended to reflect this. Edit made. In actuality, there is no requirement in the Transport Code that the Consignor's Declaration *must* be provided at each transfer point. Further, there is no requirement to "sign off" or retain transport documents at any interim stage of a transport. Any such "requirement" would be purely local for insurance or other purposes as the proponent indicates and it is therefore outside the scope of the Safety Guide. The transport of yellowcake is strongly regulated by the relevant regulatory authorities throughout Australia.

	considered only necessary to make that statement? In this step, it would seem better to state: "Although the requirements of both are very similar, check should be made for possible variations". These certainly will change over time.	This example is, in effect, almost an information item for the public to show a degree of regulation that applies to the transport of yellowcake. The working group considered that no change was necessary.
	Additional Example? It is not apparent why there is no example for a transport consignment of high level radioactive materials (such as spent reactor fuel) in B(U) containers by road and sea, for example. In such an event, the consignor is dealing with Category III-Yellow Label transport, as has taken place a number of times over previous years. With changes in regulations, and any new staff dealing with a consignment, a check list example should be included. There may well be other reactors in future years in Australia than those at ANSTO and the return of radioactive intermediate waste returns so that the example would be an essential component of the Safety Guide.	Again, this is a strongly regulated area and while the public could benefit from an example, it is similar in many respects to example 4.
	Authorisation of a Transport Plan? Throughout Chapter 2, there does not appear to be any specific mention of a requirement for an authorisation of a Transport Plan by a Competent Authority. For example, a properly designed and printed T*ransport Plan* is required for transport within Australia and these have required preparation and submission to ARPANSA, to our knowledge, for Category III-Yellow transport from a Commonwealth property through NSW to a port for sea transport, as well as similar transports by road from a Commonwealth property across NSW to SA. Such documentation and authorisation is submitted to Competent Authorities in the States and Territories through which passage is sought. There is one mention made in line 599, page 21, para 58, note (6). Such approvals do not seem to be mentioned specifically elsewhere except as "Notice of intended shipment", line 477, para 41, page 17.	There is no specific requirement for a "transport plan" in the Transport Code. Any such requirement is a "local" requirement of a given jurisdiction and is therefore outside the scope of the Safety Guide, other than a mention as per paras 41 and 58. It should be noted however that para 41 is referring to "Notice of an intended shipment, *where required by the IAEA Regulations* …", not "local" requirements.
	Chapter 3. Notes for Carriers Para 25 refers to the Transport Code objective is to ensure that radiation exposures do not exceed those permitted to members of the public. There seems to be no specific mention that attention should be given to the radiation level at the driver's seat where the Carrier has	The dose rate is not given in the Transport Code. However, the statement that "radioactive material shall be segregated during transport and during storage in

	agreed to provide long distance road haulage of a freight container, for example. Our experience is that it is essential that a check of the radiation level at the driver's seat should be made before the haulage begins. **Chapter 4. Notes for Consignees** Para 33 makes no mention that the consignee should **sign off** the documentation after ensuring that it is intact and contains what it is purported to contain in the documentation. Notice of receipt and acceptance would be essential in any inadvertent circumstance which followed delivery. **Chapter 5. Competent Authorities** The role of the Competent Authorities is well set out and clearly stated. Nevertheless, when the matter of Shipment Approval is discussed in paragraphs 41 and 42 lines 477-488, particularly in the example given, there are quite a few other approvals required before the transport is put into action. It would not be clear to anyone studying this Guide that there are other regulatory authorities in those States and the Territory which must be involved in the total Australian radioactive substances transport, besides the Competent Authorities. It might even appear that the Competent Authorities' role does not extend to those which are incumbent on some other regulatory authorities. Does the role of the Competent Authorities extend to ensuring that these other regulatory authorities become involved or is it the responsibility of the Consignor to see that their approvals and clearances are sought? The matters arising in transport within a State or Territory and in passing from one Australian region to another is discussed below in the section "Transport by Road and Rail. **Chapter 6. Special Requirements for Various modes of Transport** **Transport by Sea** Para 46 would require more than one copy of the Consigner's Certificate in addition to such requirements set out by AMSA. On	transit: (a) from workers in regularly occupied working areas by distances calculated using a dose criterion of 5 mSv in a year and conservative model parameters;" is. That would necessarily require someone to measure the dose rates and calculate the dose received. There is no specific requirement in the Transport Code for a consignee to "sign off" a completed, or otherwise, transport. There are only obligations for the consignee to report any non-compliance to the consignor at receipt (para 309 of the Transport Code). The role of the Competent Authority is to administer the Transport Code. The Competent Authorities are listed in Annex A as per para 40. The Competent Authorities only have authority over the relevant jurisdiction. Noted. This will be determined by AMSA.

	transfer from road Carrier to Ship's Captain, retention of one copy by the Consignor or by the Carrier on behalf of the Consignor would occur. The Ship's Captain would need to have a one copy for his retention and another one at least to pass on at the arrival port. **Transport by Air** Para 51 appears to contain an oxymoron as it is worded. It would seem preferable to remove the "If" part and state that: "ICAO Technical instructions or IATA Dangerous Goods Regulations have items that are listed as FORBIDDEN for air transport. For more detail about this listing and special permission for an item, refer to para 55 below about the supplement covering such special permissions." Para 53 refers to the need for attention to detail if delays in transit are to be avoided. Delays in arrivals at intermediate airports through late arrival of an aircraft even within Australia can create some problems in matters of storage because there are often no accepted places for storage of radioactive Class 7 packages or transport containers. Customs storage depots are usually not registered as Class 7 secure storage locations. Such problems occur also at ports as mentioned below. **Transport by Road and Rail** As mentioned earlier, "Competent Authority Approval as required" is stated in line 599, para 58 (6). No indication is given of an authorisation for a given Transport Plan which has been seen in the past as a definite requirement by Competent Authorities in Australia including ARPANSA and by State and Territory regulatory authorities.. We draw attention to other documentation which is required when producing a Transport Plan for authorisation through ARPANSA and on to State regulatory authorities: 1. Check that freight containers are good condition and in current survey by Competent and regulatory authorities 2. Lashing approval for items in freight containers by Competent Authority representatives. 3. Check that Dangerous Goods Approved Driver's Licenses are	This wording has now been amended for clarity in accordance with this comment. Noted. The transport plan issue has been considered above.

	held and current. 4. Approvals by regulatory authorities for DG licensing of the truck or train 5. Check list of safety equipment on board by regulatory authorities 6. Weighbridge weight certificate, checked by regulatory authorities. 7. Medical First Aid procedures/fire precautions, usually by fire brigades.	These are all “local” requirements and are not requirements of the Transport Code.
	In relation to some of the Examples given in the Draft Safety Guide, no mention is made that all freight containers to be used in the transport of the goods MUST be in **current survey (note 1 above).** This refers to the small metal attachment to the freight container showing the date to which the survey is current and the permissible mass in the container. Before any transport or loading takes place, an inspector on call comes and inspects the survey plate and the condition of the container. He either passes the container as suitable or rejects it. Rejections have occurred. Similar inspections must take place for other smaller containers which transport radioactive material.	This would be a “local” requirement and not a requirement of the Transport Code.
	Competent Authorities in each Commonwealth region, State or Territory through which the vehicles pass will require their approval, as quoted in para 41, page 17 and 18, but so will various regulatory authorities in those regions. On such long distance haulage across State boundaries, there will be matters arising in the provision of change drivers, rest periods in secure areas, fuel loading under security. Secure areas are required in the Transport Code but these have to be found and approvals negotiated because approved secure areas for Class 7 transports presently do not exist. These difficulties have to be overcome in each transport situation which arises, to meet the requirements of the Transport Code.	These issues, including the “approval” of secure areas, are outside the scope of the Transport Code.
	Para 60 (1): Trans-shipment and Storage of Load refers to the hand over of all documentation relating to the consignment for the next stage of the journey. It is essential that the person responsible for that next stage signs off that the documentation has been received and that the load is now his responsibility. No signatures are so mentioned in this Safety Guide.	This is not a requirement of the Transport Code.
	Para 60 (2): It is stated that radioactive material should be stored in	

	secure areas with restricted access. It is not clear whether those writing this Safety Guide are aware that there are no such secure areas for appreciable quantities of radioactive material in transit in NSW except at ANSTO or in smaller quantities in such places as hospitals. For example, secure storage of freight containers with intermediate or high levels of radioactive material cannot be stored in an already secure location in the NSW, approved for such materials as toxic liquids and chemicals. It is not approved for storage of nuclear radioactive material on any time scale because it is in a Council "No Nuclear Zone". An indication of such difficulties applied when several freight containers with ANSTO Spent Fuel arrived at the port and the ship had a delayed arrival. The containers could not stay on the wharf. A large area near the port was clear and fenced but it was within a Council "Nuclear Free Zone". The question arose whether the containers should go back, escorted by police and other vehicles, to ANSTO by road once more, or could a clearance be obtained for potential limited storage with security guards posted for as long as necessary. Fortunately, limited approval was obtained and the storage took place under guard for many hours. If transport of appreciable levels of radioactive substances within Australia is to take place more and more in the future, approved secure storage places are needed within range of ports and airports, and potential transport routes, without consignors having severe transport difficulties to and from by road or rail. It would seem appropriate that such a storage matter should be investigated by ARPANSA with some reference to this storage location difficulty in most parts of Australia. **9. Schedules** The Schedules in the Draft Safety Guide are essentially the same as in the Code. Having used the Transport Code and been through both, there is no comment needed. **Editorial Notes** A. "a inconsistency" in line 103 on page 5 should read "an inconsistency". B. All footnotes from page 1 up to page 77 have a letter or	This is an issue for the relevant Competent Authority in accordance with the criteria specified in the Transport Code. The denial of shipment issue, which this would appear to be, is considered significant and is being investigated by the IAEA, Noted, although the IAEA removed the Schedules from the 2005 Edition (i.e. the Transport Code) and that is why they now appear in the Safety Guide. Done

	numbering system ranging from letters such as a to g or 1 to 13. Attention is drawn to the difficulty in reading or finding the letter or number in the page where a footnote is entered because a smaller font has been used than the font in the textual matter. The result is that the footnote number does not appear as a superscript properly but at the end of the word and in the middle of the line, making it almost indecipherable. Where there is no change of font size in the text such as in cm^2 or 10^3, the superscript is readable. C. In Annex B on page 71, line 2087, reference is made to the 1996 IAEA Basic Safety Standards and quoted as (BSS 115)[1]. This Reference [1] does not appear anywhere. D. Page 91, line 2115, has the word "produces" which should read "products" E. As printed out, "2. Test for Package Type" Flow chart runs below the rule and two line page footer "Safety Guide etc", making overprinting difficult to read. Suggestion is that the flow chart is altered or the footer and rule removed from that page though some place for the page number 74 might be needed.	This is an issue for formatting in the final print stage. Changed to reference [2], which is listed in the Reference section. Done. For formatting before final printing.
04 Russell Robinson MARPS MAIOH Manager Radiation Protection Northern Territory Department Health and Community Services	I do have one thought about this safety guide and that is that there doesn't appear to be a paragraph on the security of radiation sources during transport. In view of the amount of effort going into source security one paragraph may be worthwhile. This would be an opportunity to distinguish between cat 1 to 5 sealed radioactive material and category 1, 11, 111 labelling of radioactive material for transport.	Noted. An extra paragraph has been added at the end of the Carrier information section of the Safety Guide. Security requirements for consignors and consignees will be applied separately under authorisation provisions of the relevant regulatory authority.
05 Mike Carter, a member of the Radiation Advisory Council	This paper has made me think a bit harder about the meaning of some of the transport regulations. The use of the term Specific Activity has often been misused recently, including in the ARPANSA Predisposal guideline. Specific Activity, using capital letters, means the activity per gram of the pure radionuclide as calculated from its half-life. I am fairly sure that in the international transport regulations LSA means exactly this – the activity concentration calculated from the radionuclides half-life.	

	In schedule 5 on page 37 of the ARPANSA document refers to limits based on estimated average specific activity. I had not noticed this before and I am puzzled how to calculate or estimate an average Specific Activity. An average activity concentration could be estimated, but that would have problems if the material being transported were a mixture of high SpA material and low SpA material. None of the 5 examples in the Safety Guide cover the question of average SpA. If activity concentration or average activity concentration is intended rather than SpA and average SpA it should be made clear. In either case one of the examples should have covered this. Three of the examples use the total activity of the radionuclide to determine the transport requirements, which seems to be the correct approach but increases my confusion over the specific activity question.	This is the wording used in the Transport Code, defined in para 226. Specific activity is defined in para 240 of the Transport Code.
06 Cameron Jeffries Scientist Radiation Protection Division Environment Protection Authority South Australia	• It is all very interesting to have an example about uranium product transport. However, this is highly regulated by both radiation protection legislation and non-proliferation legislation. In general all parties involved will be very aware of how to transport uranium product. A greater number of questions from the transport industry relate to transport of uranium mining related samples from exploration, mining and processing, that are transported to and from laboratories. • Schedule 5 LSA-I; In general some of the types of materials listed as being LSA-I will be transportable as excepted packages depending on the dose rates. It would be good if the Safety guide mentioned this and made some comment on the relationship between LSA-1 and excepted packages. • A comment about the possibility/issues of unpackaged LSA-I, with unlimited A_2, being transported in bulk as an excepted package might also be useful.	Noted. This example is included more as a public information item. Ultimately, if it is an excepted package, that will “take precedence”. Noted.
07 Dr Barbara Shields, MARPS Senior Health	**Comment inserted at Section 1, Introduction, Line 5** “road, rail, or inland waterway” *Keith – given your comment below (aif2), should you not state where air transport is covered? Or, at least, whether there are any significant differences between these requirements and those for*	“sea” and “air” removed.

Physicist Department of Health and Human Services, Tas	*air.* **Comment inserted at Section 1, Introduction, Lines 36-39:** **"The Consignor (shipper)** – anyone who presents a consignment of radioactive materials for transport, and who is named as consignor in the transport documents. The consignor may be an individual, company, government or other organisation." *The consignor or a "deemed employee" of the consignor must have current dangerous goods training for air shipment.* **Comment inserted at table heading, line 163** ">5 µSv/h" *There is a maximum level – it is not open ended.* **Comment inserted at Example 3, line 190** "absorbent material" *Could provide info on suitable material.* **Comment inserted at 55(2) Trans-shipment of Storage of Load, Line 594** "package gives off significant heat" *What type of package likely to do this?* **Comment inserted at paragraph 57, line 613** "check list" *Could add something in here about whether training is up to date.* **Comment inserted at paragraph 60, 10(b) – line 652**	This is most likely irrelevant for this Safety Guide as it does not specifically apply to air shipments. Further, this clause is only defining what/who the consignor is. Range to ≤10 mSv/h inserted. Noted. It would be difficult to try to describe what type of packages do or don't give off "significant heat". If a package is giving off any heat, this should obvious and storage arrangements should take this into account. This is probably not relevant for this type of checklist. Done.

	"if required" *Example?* **Comment inserted at Line 752** "A conveyance and equipment" *Provide some background as to why these are even mentioned here?* **Comment inserted at Schedule 1, line 793** *Could be useful to give an example of "typical" contents of each kind of package in these schedules. Would be more informative and interesting than all this rather dull text. A few pretty pictures could also add interest – relevant pics, of course.*	It would be difficult to insert an example Type B(U) certificate due to copyright or proprietary issues. "conveyance" is defined in the Transport Code and "equipment" has a dictionary meaning and is probably self-evident in the context. This might be difficult due to copyright or proprietary issues involved.
08 Ryan Gilchrist ANSTO	**ANSTO's comments on the draft ARPANSA Transport Safety Guide 2008** 1. **Overall Purpose** The extent of the purpose for the document needs to be better defined. Paragraph 1 states that the document has "been prepared to assist persons in meeting their responsibilities under the Code of Practice". While this is to be commended, from experience, what people want is a practical guide that simply explains to them what to do when they want to transport radioactive material. To some extent, this is addressed from the Schedules (which are drawn from the previous version of TS-R-1), Section 7 and Annex C. These sections (there are others but they are addressed individually below) would benefit from being co-ordinated to provide a practical approach. As an example of a good practical guide, we would cite Section 10 of the International Air Transport Association (IATA) Dangerous Goods Regulations. This section individually sets out the specific requirements of each major step of transporting a radioactive package (eg. package determination, packaging, labelling, documentation). Noting that ARPANSA has jurisdiction over the transport of radioactive material, the	Noted. Noted.

	approach taken by the IATA regulations has been designed to be compatible with the approach for other classes of dangerous goods. This is useful for transporters as they are already familiar with these other classes.	
	2. **Paragraph 4**	
	Although the IAEA regulations are accepted internationally, there are many carrier and country variations that need to be taken into account (eg. Pu-239 sources cannot be flown in the US). These variations are well noted in the IATA regulations. The document Guide would benefit from reference to these variations.	The WG believes that the sentiments expressed in para 4 are sufficient. The word "should" is used (as opposed to "will") and advice is given to consult air or sea transport authorities, who should be aware of limitations outside Australia.
	3. **Section 2**	
	We commend the approach of providing worked examples for consignors.	Noted.
	The examples provided would be better positioned after the guidance material and especially after the Schedules.	Noted.
	4. **Line 376**	
	The paragraph starting on this line is incomplete. Vehicles carrying White-I (Category I) labelled packages must also be displayed.	Amended.
	5. **Line 415**	
	"Work" should be changed to "area of incident".	Done.
	6. **Paragraph 39**	
	It would be useful if the Guide included a statement regarding the recognition by one Competent Authority of a decision by another Competent Authority. (i.e. the position with regards to the need, if any, to obtain approval from more than one Competent Authority for the same package e.g. if something has been approved by the Competent Authority for air, whether it also has to be certified by the Competent Authority for road/rail).	These recognition items are contained in the Transport Code. For example, a type B(U) package is universally recognised without further certification. Anything beyond this however is a potentially complex legal situation that would need to be worked out at government (regulator) level.

	7. **Section 7** The inclusion of a 'check list' for consignor's, carriers, and consignees in the guidance document is commended. However, the Guide would benefit from having additional information in the checklist. This is most notable in Paragraph 64, wherein information such as UN Number, Proper Packaging Name, Consignor/Consignee name and address, package weights etc is no included.	Inserted into a dot-pointed sub-item (4).
	8. **Paragraph 68(g)** This paragraph should be clarified as it could be misinterpreted as only applying to people having direct contact with spilt radioactive material in an accident situation. Depending on the nature of the radioactive material and accident conditions, bystanders may also become contaminated and need subsequent attention.	Sub-item (g) split and a footnote added to reflect the comment made here.
	9. **Annex C** The inclusion of flowcharts to assist consignors in preparing for transport is a good idea. However, the flowcharts seem to be in the wrong order (i.e. the package type should determined before the category). Furthermore, as alluded to previously, the flowcharts could be better implemented. A comprehensive flowchart (or series of flowcharts) including additional information on areas such as labelling and placarding (including what information needs to be recorded, where, and how many labels are needed) and filling out the Consignor's Declaration would make the guide substantially more practical.	The order of the flowcharts has been changed.
	10. **Annex D** The information in this Annex is not directly related to transport operations and therefore does not benefit the document as a practical guide. Furthermore, the nature in which it is set out could raise serious concerns in people who are not radiation protection professionals, but whom may still occasionally transport radioactive material. We suggest that this section be removed altogether or greatly simplified to concentrate on how the transport regulations meet radiation protection principles.	The Health Effects Annex is a standard inclusion in all ionizing radiation Standards, Codes and Safety Guides.

	11. **Consigner's "Declaration" vs. Consignor's "Certificate"** This section should be amended for consistency as the term Consignor's "Certificate" is frequently used throughout the guide, whereas the terminology used in TS-R-1 is Consignor's "Declaration". 12. **References** The IATA Regulations should also be referenced as many transporters of radioactive material will be familiar with this document.	 All occurrences changed to "Consignor's Declaration". Noted.