Questions from the Australian RIS

Volvo Penta is committed to supplying environmentally responsible marine products and supports the efforts of regulatory bodies around the world to enact fair and effective emission legislation. Volvo Penta looks forward to working with Australia on its regulatory journey.

Before answering the questions posed by DEWHA, Volvo Penta offers these introductory comments. After reading the RIS, there seems to be confusion regarding the EPA regulations. The EPA regulations are much more than a marine engine emission standard. The EPA regulations that were enacted in October 2008, address many different off road product classifications. Marine products covered by the regulation include sterndrive/inboard engine exhaust and evaporative emissions, outboard engine exhaust and evaporative emissions, boat fuel system evaporative emissions, jet drive boat engine exhaust and evaporative emissions and PWC engine exhaust and evaporative emissions. The EPA regulations pertaining to marine products started to phase in with calendar year 2009. These regulations will not become final until calendar year 2015. Different marine segments are on different time frames within that six year period.

Volvo Penta, as well as most major marine manufacturers, was an active participant with EPA in the negotiation of the regulation. EPA opened the table to interested manufacturers to ensure that no one marine manufacturer or marine industry segment was given an unfair competitive advantage over another in the regulatory process. The EPA was keenly aware of all the stakeholders' concerns and some of the phase-in programs within the EPA regulation were introduced to address those stakeholder concerns.

While proposed regulatory action on all marine product segments is of interest to Volvo Penta, our greatest concern is for sterndrive/inboard engines and the boat fuel system evaporative systems (boat builders are our major customers). New regulations in these areas will have a dramatic impact on our business.

Below are charts that summarize the EPA regulations pertaining to sterndrive/inboard engines and the boat fuel system evaporative systems:

Sterndrive/Inboard EPA Engine Emission Rule Summary

Requirement	Year			
	2010	2011	2012	2013
Exhaust				
HC+NOx (5 g/Kw-hr)	Yes[a]	Yes[a]	Yes[a]	Yes[a]
CO (75 g/Kw-hr)	Yes[b]	Yes[b]	Yes[b]	Yes[b]
Evaporative				
On-engine fuel hose (15 g/m^2/day)	Yes	Yes	Yes	Yes
OBD-M	Yes[c]	Yes[c]	Yes[c]	Yes[c]
Engine Exemption	Yes (4.3 & 8.1 GM engines)	No	No	No
NTE	No[d]	No[d]	No[d]	Yes
Torque Broadcasting	No	No	No	Yes
Green House Gas				
CO2	No	Yes[e]	Yes[e]	Yes[e]
CH4	No	No	Yes[e,f]	Yes[e,f]
N2O	No	No	No	Yes[e,f]

[a] This is a corporate average maximum - no one engine family can exceed 16 g/Kw-hr HC+Nox

[b] This is a corporate average maximum - no one engine family can exceed 150 g/Kw-hr CO

[c] OBD-M is only required on catalyst equipped engines

[d] NTE is not required if the engine family was previously certified with CARB and the data was rolled over. Any changes that result in new submission data requires NTE certification

[e] This is a reporting requirement only and is not regulated at this time.

[f] Reporting parameters are yet to be established.

This chart shows that there are subtle but substantial differences from year to year as the EPA regulations are phased in over time. All of the requirements in the chart must be met before the EPA will issue a compliance certificate. That means that in addition to normal product development, Volvo Penta must prove emissions durability to 480 hours. This testing is time consuming and costly, in most cases doubling or even tripling normal product development cycles.

The requirements above and specific labeling requirements are the sole obligations of sterndrive/inboard engine manufacturers under the EPA regulation. While Volvo Penta is actively developing our engine lines to meet the 2013 SD/I requirements, this work will not be completed in advance of the EPA 2013 deadline.

EPA Boat Evaporative Standards

Standard/ Category	Hose Permeation	Tank Permeation	Diurnal Emissions
Standard level	**15 g/m^2/day**	**1.5 g/m^2/day**	**0.40 g/gal/day**
Boat Fuel systems	**2009[a]**	**2012**	**2011[b,c]**

[a] 2011 for Outboard primer bulbs

[b] Fuel tanks installed in non-trailerable boats ($\geq$ 26 ft. in length or >8.5 ft. in width) may meet a standard of 0.16 g/gal/day over an alternative test cycle.

[c] The standard is effective July 31, 2011. For boats with installed fuel tanks, this standard is phased-in 50%/100% over the first two years. As an alternative, small manufacturers may participate in a diurnal allowance program. Each small-volume boat builder will have a total of 1,200 allowances that may be used, at the manufacturer's discretion, for boats produced from July 31, 2011 through July 31, 2013.

Under the EPA regulations, the boat evaporative requirements outlined above are the responsibility of the boat manufacturer that assembles these components into a completed product. (There is also an EPA labeling requirement.)

While the EPA requires Volvo Penta to certify each engine family, there is no such requirement for boat builders. Boat builders instead are required to build their boat fuel systems using EPA certified components (fuel tanks, hoses, fuel fill caps, carbon canisters, etc). The fuel system component manufacturers are responsible for obtaining component certification from the EPA.

Outboard engines, PWCs, and jet boats have their own unique requirements within the EPA regulation and are on different implementation timelines. (Volvo Penta does not offer products in these segments.)

The "EPA Final Rule" does not take effect until the last phase-in (which is a low permeation requirement for outboard engine under cowl hoses) is complete in 2015. At that time, ABT is still in place and available to engine manufacturers to allow competition in certain market segments.

The EPA rule with flexibilities (whether phase-in or ABT) are calendar year based. With normal lead times, most engine manufacturers have already or are about to file for EPA certification of their 2011 model offerings. Many engine manufacturers may already be building 2011 models, which is allowable under the EPA regulation. In order to meet an implementation date of January 2012, an Australian compliance agency must be operational by January 2, 2011 (assuming Australia follows the model year definitions in the EPA regulations).

That is the first date within the US EPA regulation that 2012 engines could be built.

Volvo Penta recommends that DEWHA recognize and accept US EPA certification to implement Australian legislation by January 2012. Alternatively, to avoid phase-in periods, the implementation date must be extended to 2015 when the last of the flexibilities expires. (This is the option which is currently favored by the EU in the rewrite of the RCD.) If DEWHA were to impose the US "EPA Final Rule" in 2012, Australia would have a more stringent emission regulation than the US for marine products. This would force manufacturers to consider their position in the Australian market place. Manufacturers could not afford to create "Australia only models" with greater technology requirements than the rest of the world. This would severely limit product availability in the Australian market.

Volvo Penta's answers to the following questions are based on our knowledge of the EPA regulation and the above comments.

Q: What is the likely impact of adopting US emission standards on the purchase price for each type of relevant product?

A: OEM prices of our sterndrive products to our boat builder customers increased on average 15%. The OEM markup results in consumer prices in the US increasing by AUD $4000 to $6000 for a single engine boat for addition of catalyst engines. Since the boat fuel system evaporative rules have not taken effect yet in the US, there are only estimates as to what the consumer cost impact will be. For a single engine boat with a fuel tank capacity less than 375 liters, we estimate that the end customer might expect an increase at retail from AUD $ 1000 to $1500.

Q: What is the likely impact of adopting US emission standards on consumer demand for each type of relevant product?

A: Based on our experience in the US, the demand will decrease across all boat lines due to retail price increases. Smaller boats will have a greater percentage increase due to new emissions components. Larger, more expensive, single engine boats will see a smaller percentage increase.

Q: What is the likely impact of adopting US emission standards on consumer choice for each type of relevant product, i.e., if US standards were adopted, which products would be removed from the market?

A: Without some form of flexibility like averaging, banking and trading (ABT), certain market segments can be given an unfair advantage at the expense of another segment due to the regulation. The typical entry level 16 to 20 foot boat in the US is being rapidly pushed to outboard power because of the increased costs of catalyzed sterndrive engines. Outboards have no requirements for

HC+NOx below 16 g/Kw-hr within the EPA rule creating an unfair advantage. This is somewhat offset within the EPA rule which has ABT. For instance, ABT allows sterndrive engine manufacturers to offer some percentage of their production without catalysts to the same HC+NOx standard (16 g/Kw-hr) to maintain a limited presence in a certain market segment. The cost of developing and certifying engines to the EPA regulations caused Volvo Penta to leave the gasoline inboard market and drop the 3 liter entry level (4 Cylinder) engine which is no longer cost competitive with outboard engines in the same market segment.

Q: What are impacts to manufacturers and distributors of meeting US Final Rule standards through a phased approach in comparison with a non-phased approach?

A: The EPA rule is not “final” until 2015 for all marine segments because the EPA recognized that manufacturers cannot change their entire product offerings overnight. And, even with the flexibilities offered by ABT, manufacturers in the US are struggling to meet the implementation dates. Beyond ABT for sterndrive/inboard engines there are phase in periods for engine Not-to-Exceed (NTE) emissions compliance and Engine Torque Broadcasting which is not fully required until 2013.

This is particularly true in the boat evaporative systems. The fuel system suppliers are just starting to tool the components necessary for evaporative emission controls. Boat manufacturers will have to change their tooling once the new fuel system components are available. Without some sort of flexibility, manufacturers will not have enough time to convert all models and will probably have to limit their product offerings. Also, there are significant investments in tooling that need to be made for all models to be compliant. Most, if not all manufacturers, are facing devastating economic conditions world wide and do not have the money or resources to convert their entire product lines on short notice. The EPA phase in plan is intended to give boat and fuel system manufacturers time to design and build components that meet the requirements and still achieve an evaporative emission reduction quickly. Without this flexibility time for implementation must be extended out.

From: Kerry Scott
Sent: Friday, 16 July 2010 10:40 AM
To: Haemish Middleton
Subject: FW: RIS response

Importance: High

Attachments: Questions from the Australian RISRev061810.doc

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From: Bruinsma Auke [mailto:auke.bruinsma@volvo.com]
Sent: Friday, 16 July 2010 9:39 AM
To: Kerry Scott
Cc: Tony Richards
Subject: RIS response
Importance: High

att - Project Manager

NEPC Service Corporation

Level 5/81 Flinders Street

ADELAIDE SA 5000

Dear sir/madam,

please find attached and below feedback as requested to the RIS.

the below additional feedback comes after attanding the meeting held in Melbourne on Tuesday 13th July -

additional input -

To clarify, no ABT makes the potential Australia rule more stringent than the EPA rule regardless of the year of enactment. For instance our 4.3 V-6 engines will meet the caps of 150 g/kW-hr CO and 16 g/kW-hr HC+NOx of the EPA rule and will have an EPA certificate, but will be averaged in to our corporate FEL which has to remain below 75 g/kW-hr CO and 5 g/kW-hr HC+NOx.
Based on this, please realize that if you choose to accept an EPA certificate for an engine family, you will automatically be getting ABT or is the intention to "Cherry Pick" our engine families and only allow catalyzed engines into Australia that have an EPA certificate. This will be impossible for us to control and administer because we do not control the boat companies we sell to. The only thing we could do is mark all engines with tags that proclaim "For Sale in Australia" and/or "Not For Sale in Australia" and make it clear that we cannot be responsible for what ultimately ends up in the consumers hands.
Volvo Penta gas engines will not be 100% catalyst equipped until the 4.3 engine is replaced (probably in 2014).

For sterndrive/inboard engines you need to accept EPA certification with ABT. Our (emissions) dirtiest SD/I engines without catalysts are still cleaner than most clean (CARB 3-star)

If Australia is to align with the US, then ABT must be part of the Australian rule

ABT is part of the US EPA rule going forward regardless of the year. We will be able to use ABT in 2018 or 2020 in the US if we so desire. No ABT means that the rule in Australia is more stringent than the US EPA .
The Canadian rule is also being worked on and it appears Environment Canada (EC) is going to accept EPA certification (and ABT) as they realize that doing otherwise will make their rule more stringent than the US. Both US and Canadian engine and boat manufacturers have told EC that this is necessary.
Most SD/I manufacturers have acknowledged that they will probably not have any non-catalyzed engines in their model line

up by the year 2015.
Please feel free to use any of my comments as you see fit in responding to the authorities. Here are some additional thoughts that you may want to contemplate for use in your response.

A. For Volvo Penta, Australia accepting an EPA cert means:

1. We do not have to limit models for the Australian market.
2. Our emissions dirtiest 4.3 V6 is still cleaner than most outboards.
3. Australian consumers will still have a choice between clean outboard powered boats and clean stern drive powered boats in the entry level market.

B. Volvo Penta sells gas engine stern drives to approximately 200 boat builders may of which may export models to Australia. Therefore, Volvo Penta really has no means of controlling what boats are being sold into the Australian market. We could have some control over the stern drive engines that are sold to Australian boat builders.

best regards

auke bruinsma

general manager

volvo penta oceania

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