

# North Pacific Fishery Management Council

Richard B. Lauber, Chairman  
Clarence G. Pautzke, Executive Director

605 West 4th Avenue  
Anchorage, Alaska 99501



Mailing Address: P.O. Box 103136  
Anchorage, Alaska 99510

Telephone: (907) 271-2809  
FAX (907) 271-2817

## ADVISORY PANEL MINUTES DECEMBER 7-10, 1992 ANCHORAGE, ALASKA

Approved by \_\_\_\_\_  
Date 1/18/93

The Advisory Panel for the North Pacific Fishery Management Council met on December 7-10, 1992, at the Anchorage Hilton Hotel. Members in attendance were:

John Bruce  
Alvin Burch  
Gary Cadd  
Phil Chitwood  
Dan Falvey  
Dave Fraser, Vice Chair  
Spike Jones

Kevin Kaldestad  
David Little  
Pete Maloney  
Dean Paddock  
Penny Pagels  
Bryon Pfundt  
Perfenia Pletnikoff

John Roos  
John Sevier  
Michael Stevens  
Beth Stewart  
John Woodruff, Chair  
Robert Wurm

Approval of minutes for the August and September 1992 meetings were approved.

### B-5 MARINE MAMMAL REPORT

The AP heard a NMFS report on killer whales and harbor seals. It asks the Council to;

1. ask NMFS to work with industry to set up meaningful observation procedures for killer whales where industry could help monitor the abundance and general health of these animals,
2. ask ADF&G to submit a report on its studies on the status of harbor seals,
3. continue to push for research on all marine mammals and sea birds.

Further, the AP would like to see the final reports on killer whale and harbor seal abundance surveys when they are available, and the AP reiterates its concerns related to declining marine mammal populations and possible relationship between these declines and ecosystem health.

### C-1 OBSERVER PROGRAM

The AP heard staff reports on the Research Plan and Environmental Assessment/Regulatory Impact Review for proposed regulatory amendments to the current Observer Plan. It also received limited public comment.

In its discussions about regulatory amendment changes, the AP is aware that the Research Plan should be approved by mid-1993 and in effect by 1994. At that point, many of the problems with the current plan should be eliminated. The AP struggled to enact major changes to the current Observer Plan in light of this. In regards to the proposed regulatory amendment package, the AP has the following recommendations to the Council:

1. Under lowering the limit length for the 100% observer coverage requirement, the AP recommends the Council adopt alternative 1; status quo. This motion passed 12-7. The AP believes the number of vessels in question is small, that too much of the data being gathered now is not being used and that it doesn't make sense to add cost to an already struggling industry.  
{Minority Report to follow}
2. Under lowering the length for the 30% observer coverage requirement, the AP recommend adoption of alternative 5, establishing a pilot program for all gear types. This motion passed 13-5.

The AP believes this group of boats (57-59') accounts for a very small percentage of the total quota, that boats under 60' will begin to pay into a plan as soon as the Research Plan is approved and that a pilot program for 57-59' boats supported by industry to lower applied bycatch rates will be more effective than the blanket requirement of 30% coverage.

3. Under defining fishery days, the AP unanimously recommends adoption of alternative 2 with the caveat that the final rule as written should not micro-manage in terms of the exact measure of "actual" fishery. The AP thinks this reduces significantly the room to manipulate "fishing" days and will help clean this area up as long as the measure of "actual" fishing isn't too minutely defined.
4. Under changing the quarterly requirement on 30% observed vessels, the AP recommends the Council adopt alternative 1, status quo, with the stipulation that the Regional Director should use hot spot authority for fisheries predetermined to need coverage. These should include requiring some observer coverage on some of the southeast outside longline vessels as well as some of the deepwater flatfish trawlers and Pacific cod/bottom pollock trawlers. This motion passed 15-3. The AP struggled with several of the other alternatives but failed to see how they would work effectively in terms of getting NMFS the information it needs and in terms of requiring vessels to take observers in all fisheries without adding cost and overtaxing the observer system. The AP clearly sees that the Research Plan, when enacted, will take care of that problem by simply assigning what fisheries have observers and removing the discretionary options the vessels now have.
5. Under levels of coverage for pot vessels, the AP recommends the Council adopt alternative 3. This motion passed 15-3. The AP sees no difference in vessel size in terms of coverage in this type of gear since the gear is the same regardless of the vessel length and hauled one pot at a time.
6. Under conflict of interest, the AP unanimously yields these specific decisions to the Council, NMFS, and NOAA-GC. The AP thinks these are steps in the right direction but we had no public testimony on this or opportunity to engage in discussions with industry experts.
7. Under requiring two observers, the AP recommends the Council adopt alternative 3 with the language "up to 2" observers rather than "multiple" and with the recommendation that NMFS differentiate catcher vessels delivering to motherships by PIN number for publication on the bycatch BBS. This motion passed 11-7. The AP believes there are situations where more than one observer is needed but that the Regional Director is the one to determine these based on data and bycatch needs. The AP thinks the Regional Director, if he uses his authority, could do a much better job of identifying these situations than a predefined situations through regulation.

## MINORITY REPORT

C-1 (1)

We, the undersigned members of the AP, support alternative 2 in the EA/RIR/IRFA for a regulatory amendment which would reduce the lower vessel length limit for the 100% observer coverage requirement from 125' to 115' LOA. In our view this expanded coverage would fill in the gap for observer data that are needed to obtain accurate information for approximately 9.3% of groundfish that is caught by these vessels but currently not included in weekly in-season management. In order that accurate data are collected, we advise the Council to lower the vessel length to include this coverage. This will provide for more sampling to improve statistical reliability of this data which affects all vessels participating in these fisheries. By including these 33 vessels, coverage on this largely shoreside component of the fleet will be more accurately represented.

Signed:       D. Falvey  
              D. Fraser  
              P. Pagels  
              M. Stevens  
              J. Woodruff

---

### C-2 COMMUNITY DEVELOPMENT QUOTAS

The AP heard a brief staff report on the status of CDQs. It recommends the Council split 1993 CDQs identical to the open fishing for A and B seasons. It also recommends the A season apportionment of CDQ pollock be made outside of the open fishing A season (so that there is no reduction in the A season amount in the open fishery).

(This motion passed 10-5)

### D-1(a) MORTALITY RATES FOR HALIBUT

The AP recommends the Council use the following rates:

Trawl fleet     Use the numbers as recently recommended by IPHC/NMFS. (These are from the 1991 data points).

Longline fleet Use an average of the numbers recommended by IPHC/NMFS and those used last year.

The AP also recommends that careful release techniques be encouraged so these rates can be reduced.

(This motion passed 15-2)

In making this motion, the AP believes that while this is the best information available there are recent changes in the longline fleet to produce better results. (Such as gangion cutting, careful release, etc.). These were not used in 1991 but were in 1992. The AP believes the 1992 data and the 1993 observation of mortality will be much lower than the 1991 data. We think because of this, it's not inconsistent to apply the data points differently.

## **D-1(d) GOA 1993 GROUND FISH SPECS**

The AP heard Staff, ADF&G, and NMFS reports on the GOA SAFE document. It recommends the attached table of TAC's for 1993.

(This motion passed 16-1)

As rational on each species:

### Pollock

The exploitation rate is the same as the past few years on a stock that hasn't shown dramatic sign of improvement. It's a rate that's on the conservative side of the ABC's suggested by the SSC and Plan Team and a rate that's worked in the recent past. Also, the fishery is now predominately 1988 year class and their fish should be around for the next several years.

### Pacific cod

AP accepts PT/SSC recommendation and sets TAC = ABC since OFL is well above ABC. It's very clear that the industry will harvest all the TAC

### Deepwater flats

AP recommends the TAC the same as 1992; allows for expansion of fishery, is very conservative, well under ABC, halibut bycatch may constrain anyway.

### Flathead sole

AP recommends the TAC the same as 1992, allows for expansion of fishery, is very conservative, well under ABC, halibut bycatch may constrain anyway.

### Arrowtooth

AP recommends this TAC because it allows for expansion of fishery, is very conservative, well under ABC, halibut bycatch may constrain anyway, and it allows for the requested industry expansion in the central Gulf.

### Shallow flats

AP recommends this TAC because it allows for expansion of fishery, is very conservative, well under ABC, halibut bycatch may constrain anyway, and it allows for the requested industry expansion in the central Gulf.

### Sablefish

Same rationale as Pacific cod. Further, NMFS has done well in keeping the total Gulf TAC in line.

### Pacific ocean perch

AP supports the SSC and Plan Team's recommendation. The AP debated this issue extensively and is fairly divided. However, this species will be bycatch only until third quarter at which time NMFS can decide about a directed fishery.

### Slope rockfish

The AP thinks TAC should be 90% of ABC, because a buffer is needed since the catch in 1992 exceeded in some areas of the Gulf.

### Pelagic shelf

TAC can be equal to ABC since it's well below OFL and catch in 1992 is well under TAC in all areas.

Black rockfish

This specie should be put back into Pelagic shelf complex and ADF&G use emergency order authority to close problem areas.

There is no biomass data on black rockfish, only catch information and that's by no means credible. The reason to break this species out was to address certain problem spots and this can be done with emergency rule. Until biomass data is available, it's impossible to get a TAC.

Demersal shelf rockfish

Leave at ABC; its been well managed even at very low TAC levels.

Thornyheads

TAC should be set at 90% and for bycatch only, since the entire TAC is likely to be needed.

Additional Recommendations:

1. Halibut PSC apportionments.

Trawl gear 600 mt - 1st quarter  
400 mt - 2nd quarter  
600 mt - 3rd quarter  
400 mt - 4th quarter

Longline gear 200 - January 1 - July 14  
500 - May 15 - August 31  
50 - September 1 -

2. Rockfish management

- (a) AP recommends the Council initiate a regulatory amendment to redefine/re-evaluate directed fishing standards to reflect true unavoidable bycatch of rockfish and prevent topping off.
- (b) AP recommends the Council initiate a regulatory amendment to require unobserved vessels to retain all rockfish. Adequate enforcement guidelines to maintain the directed fishing standards. should be analyzed as well.

**D-1 (e,f) BSAI 1993 GROUND FISH SPECS**

The AP heard NMFS report on the SAFE document. It recommends to the Council by a 17-1 vote, the attached table of TACs.

The rationale for these TACs is as follows:

Pollock

(EBS) This represents a compromise amongst AP members, since some wanted a TAC at ABC, 1,340,000 m/t while others wanted it at 1,100,000. This TAC is sufficiently under the OFL. Some AP members also note that the amount of pollock in reserve is no longer 15% but 7 1/2% so this lower TAC relative to the ABC should provide added buffer for NMFS.

(AI) The TAC is the same as 1992. It is also well under the OFL.

(518) The TAC is set for bycatch purposes only. This is the same action taken as 1992.

Pacific cod

This TAC was hotly debated by the AP and represents a compromise. There was a lot of confusion and doubt about various models and potential ABCs, which ranged from 130,000 to 190,000 m/t.

Yellowfin sole

This TAC is well under OFL and the yellowfin sole fishery could be much more popular with pollock "B" season changes.

Greenland turbot

This resource still appears to be in tough shape; this TAC allows for bycatch amounts and is well under OFL.

Arrowtooth

This TAC is about equal to 1992 catch and should be adequate for bycatch. AP members don't see any targeting on this specie in the Bering Sea.

Rock sole

TAC is about equal to 1992 catch including discards. AP members think at least this amount will be needed for bycatch needs, and some directed catch needs.

Other flats

Sablefish

TACs are equal to ABC but well under OFL. These fish should be able to be retained if caught up to the ABC. 1992 catches are well under these TACs.

Pacific ocean perch, Other rockfish

These TACs are set based on 1992 catch, expected bycatch needs and the OFL. Furthermore, in most cases, the fisheries in which these species are caught are 100% observed.

Atka Mackerel

The AP recommends a TAC of only 32,000 m/t if there is no geographical split of area. We are concerned about localized over fishing. If a geographical split is enacted, the AP thinks it should be at 177°W and the TAC can then be 117,100 m/t.

Further to our recommended TACs in the BSAI, the AP makes these additional recommendations to the Council.

1. Pollock Seasons: The AP recommends the pollock quota be split 40% of the ITAC to the "A" season and 60% to the "B" season. (This motion passed 12-4). This is a compromise among AP members but seems to be the best trade-off in terms of the issues involved; such as fishing on a spawning stock, economic values, inshore/offshore and CVOA, donut hole fishing, etc..
2. Trawl fleet halibut and crab PSC apportionments: The AP recommends the attached table of PSC apportionments for the trawl fleet for crab and halibut. (This motion passed 8-2). These apportionments represent the trawl industry position in their December 4th letter to the Council. The AP amended the Pacific cod fishery halibut PSC downward to 950 m/t and the additional 242 tons is redistributed proportionally into all the other fisheries. Those favoring this amendment cited minimizing the allocative effects of a higher PSC amount on other gear groups.
3. Longline PSC apportionments: The AP recommends those in the attached table. Further, the PSC should be apportioned only by fishery and not be seasons. Pot gear should continue to be exempt. (This motion passed 11-1).

These apportionments allow for fisheries other than Pacific cod to continue if the Pacific cod fishery is closed. The longline industry wants the entire Pacific cod PSC at the beginning of the year because they expect the fishery to be over by summer.

4. Herring PSC apportionments: The AP **unanimously** recommends those in the attached table. These are based on ADF&G's projected 1993 biomass and apportioned to different fisheries in the same percentages as in 1992.
  5. The AP **unanimously** recommends the Council not apportion pollock between midwater and bottom trawling. The PSC caps end up apportioning anyway and unless the definition of midwater trawling is applicable in practice, the apportionment doesn't do much.
  6. VIP rates: The AP recommends the attached table for the first half of 1993. Further, it requests that NMFS publish 1991 and 1992 performances on a vessel-by-vessel basis. (This motion passed 16-1).
- 

#### MINORITY REPORT

D-1(e-f)

The following constitutes an AP minority report on PSC allocations for BSAI groundfish trawl fisheries.

The AP noted 10 yes 9 no to reduce a trawl industry and PSPA recommended halibut PSC in the BSAI Pacific cod fishery from 1,192 m/t of halibut mortality to 950 m/t of halibut mortality.

We strongly believe that:

- 1) The 1,192 m/t of halibut mortality recommended as part of an overall halibut allocation for trawl fisheries in the BSAI should stand per the 12/04/92 letter submitted by Midwater Trawlers Cooperative, American Factory Trawlers Association, American Independent Fisheries Association, Alaska Draggers Association, America High Seas Fisheries Association, Alaska Groundfish Data Bank, Peninsula Marketing Association, and Pacific Seafoods Processors Association.
- 2) The trawl industry is the best judge of how PSC allocations can be best utilized between various trawl fisheries.
- 3) PSC allocations should not be used as a tool to "back door" manage directed cod allocations between gear types.
- 4) If the NPFMC wants to allocate cod between gear types, they should address this issue directly.

Signed: A. Burch  
P. Chitwood  
D. Fraser  
S. Jones  
P. Maloney  
J. Roos  
M. Stevens  
B. Stewart

**TABLE 1. GULF OF ALASKA GROUND FISH  
1993 Plan Team, SSC, and AP recommendations and apportionments (metric tons)**

Species	Area	1992			Plan Team 1993 ABC	SSC 1993 ABC	Advisory Panel 1993 TAC
		ABC	TAC	Catch*			
Pollock	W (61) }		19,320	18,127	44,050	111,000 ***	24,087
	C (62) }	96,000	18,480	15,518	47,500	or 157,000 **	25,974
	C (63) }		46,200	49,506	111,450	and	60,939
	E	3,400	3,400	66	3,400	3,400	3,400
	Total	99,400	87,400	83,217	206,400	160,400	114,400
Pacific Cod	W	23,500	23,500	34,399	18,700	18,700	18,700
	C	39,000	39,000	38,940	35,200	35,200	35,200
	E	1,000	1,000	1,087	2,800	2,800	2,800
	Total	63,500	63,500	74,426	56,700	56,700	56,700
Flatfish, Deep	W	1,740	1,740	125	2,020	2,020	1,740
	C	33,550	15,000	7,563	35,580	35,580	15,000
	E	3,990	3,000	73	7,930	7,930	3,000
	Total	39,280	19,740	7,761	45,530	45,530	19,740
Flathead sole	W	12,580	2000	295	12,580	12,580	2000
	C	31,990	5,000	1,731	31,830	31,830	5,000
	E	3,710	3,000	8	5,040	5,040	3,000
	Total	48,280	10,000	2,034	49,450	49,450	10,000
Flatfish, Shallow	W	27,480	3,000	1,644	27,480	27,480	4,500
	C	21,260	7,000	5,518	21,260	21,260	10,000
	E	1,740	1,740	2	1,740	1,740	1,740
	Total	50,480	11,740	7,164	50,480	50,480	16,240
Arrowtooth	W	38,880	5,000	943	38,880	38,880	5,000
	C	253,320	15,000	13,057	253,330	253,330	20,000
	E	11,680	5,000	967	29,080	29,080	5,000
	Total	303,880	25,000	14,967	321,290	321,290	30,000
Sablefish	W	2,500	2,500	2,110	2,030	2,030	2,030
	C	9,570	9,570	9,580	9,610	9,610	9,610
	W. Yakutat	3,740	3,740	4,122	3,830	3,830	3,830
	E. Yak./SEO	4,990	4,990	4,707	5,430	5,430	5,430
	Total	20,800	20,800	20,519	20,900	20,900	20,900
Pacific Ocean	W	1,620	1,470	1,249	1,240	1,240	1,240
Perch	C	1,720	1,561	2,470	1,560	1,560	1,560
	E	2,390	2,169	2,261	2,760	2,760	2,760
	Total	5,730	5,200	5,980	5,560	5,560	5,560
Shortraker / Rougheye	W	100	100	98	100	100	90
	C	1,290	1,290	1,374	1,290	1,290	1,161
	E	570	570	676	570	570	513
	Total	1,960	1,960	2,148	1,960	1,960	1,764 bycatch only
Rockfish (Other Slope)	W	1,390	1,390	1,167	330	330	297
	C	6,510	6,510	7,185	1,640	1,640	1,476
	E	6,160	6,160	783	6,330	6,330	5,697
	Total	14,060	14,060	9,135	8,300	8,300	7,470
Northern Rockfish	W		included in		1,000	1,000	1,000
	C		slope rockfish		4,720	4,720	4,720
	E				40	40	40
	Total				5,760	5,760	5,760
Rockfish (Pelagic Shelf)	W	1,212	1,212	73	1,010	1,010	1,010
	C	4,393	4,393	2,368	4,450	4,450	4,450
	E	1,281	1,281	976	1,280	1,280	1,280
	Total	6,886	6,886	3,417	6,740	6,740	6,740
Black Rockfish	W		included in		50	TAC 50	voted to
	C		pelagic rockfish		320	TAC 320	include with
	E				200	TAC 200	Pelagic Shelf
	Total				570	570	Rockfish
Rockfish (Demersal Shelf)	S.E. Out.	550	550	525	800	800	800
Thornyhead	Gulfwide	1,798	1,798	1,659	1,180	1,180	1,062 bycatch only
Other Species	Gulfwide	0	20,432	16,354	0	0	0
<b>GULF OF ALASKA TOTAL</b>		<b>656,604</b>	<b>289,066</b>	<b>249,306</b>	<b>781,620</b>	<b>735,620</b>	<b>297,136</b>

\* Catch through November 8, 1992

\*\* Pollock ABC

\*\*\*Ecosystem ABC



**BERING SEA/ALEUTIAN ISLANDS GROUND FISH WORKSHEET**

**1993 Plan Team, SSC and AP Recommendations and Apportionments (mt)**

Species	Area	Seasons	Council ABC 1992	Plan Team ABC 1993	SSC ABC 1993	Seasonal	Advisory Panel		
						Allowance	TAC	ITAC	
Pollock	EBS		1,490,000	1,340,000	1,340,000		1,200,000	1,020,000	
		Roe							0
		Non-Roe							0
	AI		51,600	58,700	58,700		51,600	43,860	
	518		25,000	169,000	42,000		1,000	850	
								0	
Pacific cod	BS/AI		182,000	127,000	164,500		154,000	130,900	
								0	
Yellowfin sole	BS/AI		372,000	238,000	238,000		235,000	199,750	
								0	
Greenland turbot	BS/AI		7,000	7,000	7,000		7,000	5,950	
								0	
Arrowtooth flounder	BS/AI		82,300	72,000	72,000		10,000	8,500	
								0	
Rock sole	BS/AI		260,800	185,000	185,000		75,000	63,750	
								0	
Other flatfish	BS/AI		199,600	191,000	191,000		79,000	67,150	
								0	
Sablefish	EBS		1,400	1,500	1,500		1,500	1,275	
	AI		3,000	2,600	2,600		2,600	2,210	
								0	
POP complex								0	
True POP	EBS		3,540	3,330	3,330		3,330	2,831	
Other POP complex	EBS		1,400	1,400	1,400		1,200	1,020	
True POP	AI		11,700	13,900	13,900		13,900	11,815	
Sharp/Northern	AI		5,670	5,670	5,670		5,100	4,335	
Short/Rougheye	AI		1,220	1,220	1,220		1,100	935	
								0	
Other rockfish	EBS		400	400	400		360	306	
	AI		925	925	925		830	706	
								0	
Atka mackerel	BS/AI		43,000	351,000	117,100		117,100	99,535	
								0	
Squid	BS/AI		3,600	3,400	3,400		2,000	1,700	
								0	
Other species	BS/AI		27,200	26,600	26,600		26,600	22,610	
								0	
<b>BS/AI TOTAL</b>			<b>2,773,355</b>	<b>2,799,645</b>	<b>2,476,245</b>		<b>1,988,220</b>	<b>1,689,987</b>	

\* If AL District is Split per Plan Team's Request. If no split, then Atka Mackerel TAC = 32,000 mt.

#### **D-2(a) POLLOCK "B" SEASON DELAY**

The AP heard staff and industry reports on managing the pollock "B" season and the EA/RIR. It also heard brief public testimony.

The AP recommends the Council set the start of the pollock "B" season to August 15th. This motion passed 13-4). Most AP members felt this date best accounted for and balanced all the factors and needs involved.

1. Product quality
2. Weather/safety
3. Bycatch
4. Marine mammals
5. Salmon processing opportunities

#### **D-2(b) GANGION-CUTTING/CAREFUL RELEASE**

The AP unanimously recommends the Council adopt alternative 3 for all non-retainable halibut on all hook and line vessels in the GOA/BSAI.

#### **D-3(a) PRIBILOF ISLAND TRAWL CLOSURE**

The AP heard a staff report on the Pribilof Island trawl closure EA/RIR. However, the AP had several questions especially relating to crab stocks in general and blue king crab in particular that could not be answered. The AP hopes one of the crab biologists can be available when this issue comes back.

The AP unanimously recommends the Council send the EA/RIR back to the preparers for more development in several areas;

1. the proposed closure area should relate more to the expressed problem blue king crab,
2. the document should have the cost-benefit analysis related to just the affected closed areas and not the entire Bering Sea,
3. more information on seabirds and marine mammals; this document hardly recognized them,
4. CPVE data (as well as survey data) should be used in establishing closure areas,
5. the effect of fisheries other than trawling on blue king crab,
6. data on pollock size if available from the proposed closure area versus outside it.

#### **D-3(b) EXCLUSIVE REGISTRATION**

The AP recommends the Council establish an exclusive registration program for pollock trawl vessels for GOA areas 62 and 63 (147°W - 159°W). (This motion passed 10-7).

Those voting in favor of this motion think this will prevent the possibility of severe overfishing of pollock in these areas as well as help coastal communities. There was also a question about factory vessels being able to participate in the Gulf pollock fishery by turning in their federal permits; this action would close that loophole.

#### **D-3(c) INSHORE/OFFSHORE, CDQ BYCATCH**

The AP unanimously recommends the Council apportion caps to CDQ fisheries based on their proportion of the pollock quota.

The AP wants the CDQ fisheries with separate quotas but thinks all other fishing should work out of the same pool.

As an additional **unanimous** recommendation, the AP recommends the Council adopt option 3 under alternative 3 to eliminate the primary halibut PSC caps that closes zones 1 and 2H. AP members think that as long as the overall cap is in place, it makes sense for the trawl fleet to fish where CPVEs are highest and bycatch rates are lowest, and that the closure zones may have lead to higher bycatch and lower CPVEs.

#### **D-5(b) EXPERIMENTAL FISHING PERMITS**

The AP recommends the Council support AFDF's experimental fishery proposal for arrowtooth flounder. (This motion passed 14-2). AP members think this project could help provide breakthroughs in produce development that may allow the industry to utilize this resource.

The AP recommends the Council hear the Terra Marine proposal at this meeting. (This motion passed 11-4)

#### **D-5(c) TRAWL MESH REGULATIONS**

The AP **unanimously** supports the study of trawl mesh regulations and development of a regulatory amendment for better, cleaner gear. There is an urgent need for improvements in gear technology.