

MEMORANDUM

TO: Council, SSC and AP Members
FROM: Clarence G. Pautzke
Executive Director
DATE: January 29, 1998
SUBJECT: Catch & Bycatch Measurement

ESTIMATED TIME
2 HOURS

ACTION REQUIRED

- (a) Magnuson-Stevens Act requirements on catch and bycatch estimation; Reports by NMFS and ADF&G.
- (b) Salmon bycatch retention regulations.

BACKGROUND

(a) Magnuson-Stevens Act Requirements

Section 313 of the Magnuson-Stevens Act was amended in 1996, placing several new and significant requirements on the North Pacific Council. Specifically, Section 313(h) reads as follows:

Section 313(h) CATCH MEASUREMENT

- (1) By June 1, 1997 the North Pacific Council shall submit, and the Secretary may approve, consistent with the other provisions of this Act, conservation and management measures to ensure total catch measurement in each fishery under the jurisdiction of such Council. Such measures shall ensure the accurate enumeration, at a minimum, of target species, economic discards, and regulatory discards.
- (2) To the extent the measures submitted under paragraph (1) do not require United States fish processors and fish processing vessels (as defined in chapter 21 of title 46, USC) to weigh fish, the North Pacific Council and the Secretary shall submit a plan to the Congress by January 1, 1998, to allow for weighing, including recommendations to assist such processors and processing vessels in acquiring necessary equipment, unless the Council determines that such weighing is not necessary to meet the requirements of this subsection.

When we first considered these requirements in December 1996, under the agenda item on tasking, I suggested that paragraph 1 appeared to be largely satisfied by existing observer, reporting, and monitoring requirements, and that paragraph 2 may be satisfied by some weighing requirements already initiated by the Council. Below is a history of Council activities on these subjects. We need to determine what more needs to be done to satisfy the requirements of the Act.

In 1990 the Council requested NMFS to analyze a requirement to weigh catch processed at sea. NMFS implemented regulations on May 16, 1994 requiring CDQ pollock vessels to either provide certified bins for volumetric estimates of catch or scales to weigh catch. Then in October 1994 the Council approved a requirement for all processors in the directed pollock fishery to weigh all pollock harvest on a scale, intending that the program be implemented within two years. The Council was briefed periodically by NMFS in 1995 on development of scale requirements and NMFS published an advanced notice of proposed rulemaking on February 20, 1996, stating its intent to require weighing of all fish on pollock processing vessels.

In April 1996, NMFS informed the Council that certified scales would be needed before the new multispecies CDQ program could be implemented. Then at the February 1997 meeting, NMFS reiterated that point and described the funding needed to commence such a program. We wrote a letter to NOAA on February 13, 1997, urging funding for the certified scale program so that the new CDQ programs could be implemented.

A proposed rule was published on June 16, 1997 that responded to comments received in the February 1996 notice, but did not require specific processors or vessels to use certified scales to weigh catch at sea. The proposed rule laid out the groundwork for testing and certifying scales and performance and technical requirements in the At-Sea Scales Handbook. (As of December 1997 the final rule reportedly was undergoing review in Washington, D.C.)

Also in June 1997, the Council requested a report from NMFS for December 1997 on the accuracy and precision of current catch reporting, in direct response to the new Section 313(h) provisions of the Act. In July, we wrote letters to NMFS on groundfish, and ADF&G on salmon, crab and scallops, requesting assessments for our December meeting. On November 20, NMFS wrote the Council requesting the agenda item be postponed until February 1998 (item C-7(a)(1)).

At this meeting, I need an indication from NMFS and the Council on whether you are satisfied that we have met the requirements of Section 313(h), and if not, what more needs to be done. To help us with this, the SSC will have held a special workshop on Monday to review our estimation procedures and catch reporting. Hopefully, they will be able to give us some idea of the adequacy of our current programs.

In addition, the following reports have been sent to you recently:

1. Observer Coverage Needs. June 1997. (Council mailing on 1/16/98)
2. Evaluation of Haul Weight Estimation Procedures Used by At-Sea Observers in Pollock Fisheries off Alaska. AFSC Processed Report 97-07. December 1997. (Council mailing on 1/16/98)
3. Analytical and Statistical Review of Procedures for Collection and Analysis of Commercial Fishery Data Used for Management and Assessment of Groundfish Stocks in the U.S. Exclusive Economic Zone off Alaska. October 1997. (Council mailing on 1/16/98)
4. ADF&G report on catch enumeration in the salmon, crab, scallop and Southeast Alaska demersal shelf rockfish fishery (Item C-7(a)(2)).

The bottom line action needed at this meeting is to determine whether we have satisfied the new Magnuson-Stevens Act requirements as described above. And, if not, determine what more needs to be done in 1998.

(b) Salmon Retention Regulations

In September 1997, the Council received a letter from NMFS requesting the removal of the salmon retention regulations that prohibit the discard of salmon taken as bycatch in the BSAI groundfish trawl fisheries until the number of salmon has been determined by a NMFS-certified observer (Item C-7(b)(1)). A report by Turnock and Karp from June 1997 was presented to support this recommendation, and is attachment 4 in the "Observer Coverage Needs" document sent to you in the January 16, 1998 mailing.

In September, the Council scheduled this issue for December, but, at NMFS' request it was postponed until this meeting. At the joint Board of Fisheries/Council committee meeting in early January, this issue was on the agenda because the State has similar regulations on the books, and they would have to be repealed also. At the committee meeting, NMFS reiterated their position that the regulations should be withdrawn because blend estimates are used to monitor salmon bycatch.

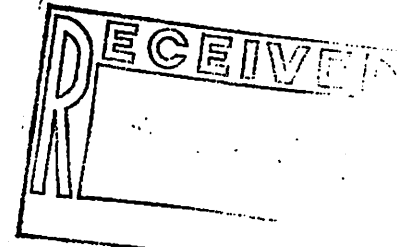
We will discuss this issue with the Board on Tuesday, and at this meeting we need to take action up or down on removing the regulation.



AGENDA C-7(a)(1)
FEBRUARY 1998
UNITED STATES DEPARTMENT OF COMMERCE
National Oceanic and Atmospheric Administration
National Marine Fisheries Service
P.O. Box 21668
Juneau, Alaska 99802-1668

November 20, 1997

Richard B. Lauber, Chairman
North Pacific Fishery Management Council
605 West 4th Avenue, Suite 306
Anchorage, Alaska 99501-2252



Dear Rick:

I am writing in regard to two items on the December, 1997, Council agenda: item D-4(c), Catch reporting accuracy/precision, and item D-4(e), Salmon retention revisions. These issues are related and complex, and I believe that additional staff work is needed before the Council considers them.

The groundfish catch accounting system uses a variety of methods, depending on the type and size of vessel or processing plant, and on the presence of groundfish observers. These methods include product weights converted to round weight using standard product recovery rates, volumetric measurements of total weight apportioned to individual species using species composition sampling, and scale weights of landed catch. None of these methods provide statistically-based estimates; therefore, determination of variance or confidence intervals for these estimates is not possible.

Consultants from Versar, Inc., under contract to the National Marine Fisheries Service (NMFS), investigated use of a statistical estimate of catch for observed processor vessels. This technique, based on observer estimates of haul weight and observer species composition sampling, allows confidence intervals to be calculated, though all sources of variance cannot be accounted for at this time.

In addition to the Versar study, the NMFS has conducted research into the statistical properties of sampling for species such as salmon, and has conducted an experiment on a trawl catcher-processor vessel which compares methods for estimating total catch weight. The methods examined include cod-end and bin volumetrics, and a flow scale. A report of this experiment is being reviewed for publication, and is expected to be available early in 1998.



The Council's Scientific and Statistical Committee (SSC) has proposed a workshop during early 1998 to discuss data collection and catch estimation. I believe that discussion of catch accounting in this forum should occur prior to Council consideration of the issue. The estimation of prohibited species catch, including catch of salmon, is closely related to accounting for groundfish catch, and I believe the issues should be considered together.

For these reasons, I suggest that the agenda items D-4(c) and D-4(e) be removed from the December agenda and that these topics be rescheduled based on the results of the SSC workshop.

Sincerely,



Steven Pennoyer
Administrator,
Alaska Region

cc: Dr. Clarence Pautzke

REPORT TO THE NORTH PACIFIC FISHERY MANAGEMENT COUNCIL FROM THE ALASKA DEPARTMENT OF FISH AND GAME DESCRIBING THE STATE'S EXISTING CATCH ENUMERATION PROGRAM TO COMPLY WITH THE MAGNUSON-STEVENS ACT REQUIREMENTS FOR ACCURATE CATCH ACCOUNTING.

Last year's reauthorization of the Magnuson-Stevens Act [Sections 313(h) (1 & 2)] required the Council to ensure total catch measurement in each fishery under its jurisdiction, that will include accurate enumeration, at a minimum, of target species, economic discards, and regulatory discards; and (2) submit a plan to Congress by January 1, 1998, to allow for weighing by fish processors and processing vessels, unless such measures are determined to be unnecessary to meet catch measurement requirements. Because the state manages BSAI crab, scallops and salmon under a federal FMP, the ADF&G was tasked with developing a report on catch measurement techniques, including an assessment of the accuracy and precision of our techniques. The following information is a presentation of this requirement.

The State of Alaska manages the Southeast salmon troll fishery, Bering Sea king and Tanner crab, the state-wide scallop fishery, and the Southeast Demersal Shelf Rockfish under delegated authority of the respective fishery management plans (FMP). Additionally the state manages Pacific cod in a restrictive state water fishery. Because the harvest limit for the state water, P. cod fishery is determined as a percentage of the federal water ABC, the determination of adequate catch measurement is important for council compliance with the Act. The following describe state practices used to answer compliance with accurate catch enumeration.

SOUTHEAST TROLL SALMON FISHERY:

Description of the catch accounting process

The troll and net catches of chinook salmon in Southeast Alaska are tallied through the use of fish tickets issued by the buyer at the time of sale. ADF&G personnel sampling for the presence of coded-wire-tags (cwt) count chinook from deliveries in order to determine the number of fish examined. These numbers are compared to the number listed on the fish ticket. The number of chinook salmon harvested in the recreational fishery is estimated through a combination of creel census and mail out surveys.

Reporting Unit of Measurement

The department requires that fish buyers report the number of fish purchased as well as the number of pounds on fish tickets.

Accounting for Unreported Catch

Minimum Size Limits Chinook salmon regulations for Southeast Alaska use minimum sizes. For the troll, sport and purse seine fisheries, there is a minimum size limit of 28". However, regulations for the sport fishery allow the harvest of fish less than the minimum size in terminal areas near hatcheries. In addition, in the purse fishery, chinook salmon less than 21" may be kept at all time while chinook salmon between 21" and 28" may never be kept. There are no size regulations in the drift or set-gillnet fisheries.

Estimation of the number of encounters of sublegal fish by the different gears is accomplished by estimating the cohort size through the Pacific Salmon Commission (PSC) chinook model and then applying size distribution at age to estimate how many are below the minimum size. A selectivity factor is then used to determine how many are encountered by the gear. Estimation of the number of chinook below the minimum size limits encountered

in the fisheries are estimated as follows: 1. Troll fishery, the estimate is based on the number of days of effort in the summer troll fishery. This is related to the average number of days of effort in a base period of 1985 to 1989 when studies were conducted to estimate the number of legal and sublegal chinook salmon encountered during chinook non-retention fisheries (CNR).

The creel census and mail out survey make estimates on the number of sublegal chinook in the sport fishery. No estimate is needed for the drift gillnet fishery.

Chinook Non-Retention Fisheries The chinook salmon fishery is managed primarily through the use of a ceiling. The ceiling is divided into quotas established by the Alaska Board of Fisheries for each gear group. For the troll and purse seine fisheries, the quota can be harvested in a short time period. Thus, both fisheries are managed for CNR. The estimate of the number of adult chinook encountered during the troll CNR fishery is done in the same manner as sublegals. For the purse seine fishery, it is computed by multiplying the average ratio of legal to sublegal catches from 1985-1987 as documented by an ADF&G study.

Economic and Regulatory Bycatch Discards

The previous discussion on CNR and size limits addresses this issue.

Effect of At-Sea Weighing on the Estimates of Catch and Discards

Because the harvest enumeration for the Southeast salmon fisheries are deemed adequate to meet international allocation assurances under the Pacific Salmon Treaty, it is assumed to meet Magnuson-Stevens Act evaluation criteria.

STATE-WIDE SCALLOP FISHERY:

The State manages scallops by region through local area management biologists and onboard observers. The guideline harvest levels (GHL) within each region are determined either by vessel survey (Cook Inlet and Prince William Sound) or set as a long term sustainable average harvest. Both GHL and catch are reported in shucked weights.

Outside of Cook Inlet, the scallop fishery is subject to 100% onboard observer coverage. During the fishery, observers report three times weekly, the vessel's scallop harvest (shucked weight) and number of tows by statistical area. The area management biologists add the fleet-wide observer reports to project fishery closure.

Additionally, vessel operators complete a fishery logbook in which they record both the number of bushels of scallops harvested, and the round weight of the scallop catch on a tow by tow basis. Observers collect data on scallop meat recovery rates on a daily basis. From this information the department can back calculate the accuracy of the reported catch weights. Observers also enumerate bycatch occurring in the scallop fisheries.

Fish tickets are completed by the vessel operator on a weekly basis. Observers also complete a weekly report which summarizes the pounds (shucked weight) of scallops harvested and the number of tows by statistical area. Fish tickets are checked/edited for discrepancies by department biologists utilizing the observers weekly report

Because this fleet is fully observed and many cross-checks are available to assure accuracy. The scallop fishery is considered to be accurately enumerated as required under the Magnuson-Stevens Act.

BERING SEA AND ALEUTIAN ISLAND KING AND TANNER CRAB:

Bristol Bay Red King Crab:

Biomass estimates are determined from the annual NMFS groundfish trawl survey. During the red king crab rebuilding program the GHL is set at 10% of the mature male population. The GHL is expressed in pounds.

During the fishery, catch is monitored via MCI computer link every 12 hours and by single side-band call-ins every 24 hours. These fleet communications to ADF&G are a subsample of 50% of the catcher boat fishing fleet.

Additionally, the catcher processors (C/Ps) portion of the fleet is fully observed. The department receives inseason reports from observers which include average weights and CPUE by which total vessel catch is determined. This information is used to estimate overall inseason fishery performance so that a fishery closure can be projected. Observers also note the numbers of female and sublegal crab, egg clutch condition, soak time information, pot position and any other bycatch.

When catcher vessels deliver, ADF&G conducts a dock-side interview which includes 65-70% of all landings. Samplers take a landing subsample of catch length-frequency, ascertain area fished, number of crab caught, number of pots pulled during the trip and take an average weight at time of delivery. This information is compared against the fleet wide fish ticket information (=number of crab landed, area fished, total weight and price paid).

Red and Blue King Crab at St. Matthew and Pribilof Islands:

GHl is determined preseason from the NMFS survey. Fishery performance and projected fishery closure is similar to that described above. All radio and MCI contact with participants is on a 24 hour schedule. Approximately 40% of the fleet report inseason. Only a few C/Ps participate, so observer coverage is low. ADF&G samples nearly 70% of the catch dock-side.

Bering Sea C. opilio Fishery:

The C. opilio fishery is more protracted (six to 10 weeks in duration) than the previous fisheries which last a matter of days. The GHl is estimated from the NMFS survey and fishery closures are projected inseason as described above. More C/P participation and a protracted fishery allows reporting on a weekly basis. The processor weekly catch reports (fish tickets) plus observer call-ins are used to project fishery closure and GHl achievement.

Information similar to the other crab fisheries is collected from fish tickets, and with more observed landings (which include observers on floating processors as well as frequent dock side sampling at shore based processors) accuracy is assured.

Bering Sea C. bairdi fishery:

This fishery is managed similarly to the C. opilio fishery. Except that at recent low GHl levels, 24 hour reporting is required from the fleet when the fishery is open. The fleet participation for inseason call-ins is 20%.

Aleutian Islands Brown King Crab:

This fishery has no NMFS survey to make population estimates. Rather, the yearly harvest guideline is based on the long term average harvest for the two distinct stocks (east and west of 174° W. long.) which have been identified for this area based on historic area of harvest.

This fishery has 100% observer coverage. Observers report on a weekly basis so that GHIL projection can be determined. The observers conduct 100% port sampling for brown king crab landings. At sea, observers collect by-catch and other biological information used to monitor stock health.

All BSAI king and Tanner crab fisheries are considered to meet the Magnuson-Stevens criteria of accurate enumeration. Except for rare instances, the state has been able to manage the harvest within the level of the GHIL range and estimate bycatch occurrences.

SOUTHEAST DEMERSAL SHELF ROCKFISH

The directed demersal shelf rockfish (DSR) fishery quota is based on the remainder of the federal TAC after subtracting an estimate of bycatch (including an estimate of unreported mortality) needs for the IFQ halibut fishery. This is a small-boat, shore based fishery with deliveries shoreside, primarily into Sitka and Craig. All deliveries are landed and weighed on state certified scales and recorded on state fish tickets. Vessels may not exceed deliveries of 12,000 from East Yakutat or 6,000 from the rest of southeast in any 5-day period. Logbooks are mandatory and require set-specific reporting which includes the exact position of set, effort, and number or pounds of fish caught (including discards) by species. State fishery biologists sometimes observe DSR fishing trips to remain abreast of fishing activities. Logbooks must be submitted with fish tickets at the time of delivery. Fish Tickets include the statistical area of catch and the pounds of each species landed. Port samplers subsample a significant portion of the catch dock-side for length/weight/age/sex and other biological information. The directed fishery is intensively monitored by port samplers and biologists. Fish ticket and logbook data are entered daily to track catch and effort.

In an effort to increase accuracy of rockfish catch reporting, ADF&G has requested that the Fish & Wildlife Protection officers allow fishermen to bring in all rockfish caught and forfeit, without citation, those rockfish landed above the vessel trip limit or bycatch limit. Since these fish have swim bladders which expand when the fish are brought to the surface, the fish are dead anyway and landings in excess of limits allow the department to both deduct the overage from annual quotas and account for all mortality. The NPFMC is considering a proposal to formalize this activity. The proposal would require all DSR caught to be delivered and accounted for. Federal directed fishing regulations technically limit the amount of rockfish bycatch that a vessel may have onboard, therefore without lenient enforcement policy these fishes would be discarded at sea, an possibly not accounted for. Other species discarded in the DSR fishery include skates and dogfish, the mortality rate of these discards is unknown, however an estimate of catch is included in the logbook data. For its size, this fishery receives more than adequate catch enumeration and research validation.

STATE-WATER PACIFIC COD:

The GHIL is expressed in round weight based upon a percentage of the federal ABC. There are no C/P's participating in this fishery so all deliveries are made at shore plants. Here ADF&G conducts a dock-side interview program where total catch, average weight, area fished and number of fish per pot (effort) are determined. The Alaska Board of Fisheries has limited this fishery to pot and jig gear. This was done to minimize bycatch and/or mortality of non-target species.

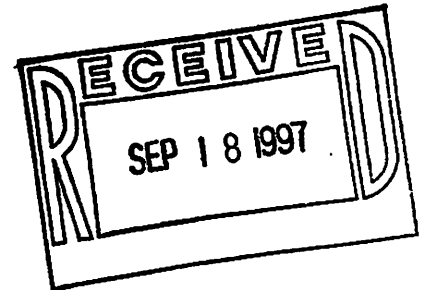
About 40% of the state-water P. cod deliveries are port sampled. Port samplers subsample length, weight, and take otoliths from the landed cod. Each delivery/landing has a fish ticket associated with it. The fish ticket defines the area fished, number caught, total weight, effort expressed as number of pots pulled and price. The ADF&G used fish ticket deliveries on a weekly (or less) basis to estimate attainment of GHF. The department conducts a catch by week analysis to determine when to close the fishery. The Catch enumeration of the state water cod fishery is also considered to be adequately sampled and sub-sampled to assure management and research biologists an accurate assessment.



AGENDA C-7(b)(1)
FEBRUARY 1998
UNITED STATES DEPARTMENT OF
National Oceanic and Atmospheric Administration
National Marine Fisheries Service
P.O. Box 21668
Juneau, Alaska 99802-1668

September 12, 1997

Mr. Clarence Pautzke
Executive Director, North Pacific
Fishery Management Council
605 W. 4th Avenue
Anchorage, AK 99501-2252



Dear Clarence,

At its September 1997 meeting, the North Pacific Fishery Management Council (Council) is scheduled to consider a repeal of regulations adopted by the Council in 1993 and implemented by NMFS in May 1994 that prohibit the discard of salmon taken as bycatch in the Bering Sea and Aleutian Islands area (BSAI) groundfish trawl fisheries until the number of salmon has been determined by a NMFS-certified observer. The intent for these regulations was to support industry initiatives to address chinook and other salmon bycatch in the BSAI trawl fisheries, collect additional information on salmon bycatch to assess the quality of salmon bycatch estimates derived from existing observer sampling procedures, and to provide additional information with which to assess the magnitude of salmon bycatch in the Alaska trawl fisheries.

We recommend that the salmon retention regulations be removed because we have determined that they do not provide useful data for salmon bycatch management or assessment. Furthermore, estimates based on observer data and those based on retained counts will always differ and have provided a basis for inappropriate arguments regarding the independence of observer sampling. We also recommend that methods currently employed for determining salmon and other prohibited species catch from observer data be reviewed with the goal of developing new inseason estimators which allow confidence intervals to be developed and used in management decision making.

NMFS staff will be available at the September meeting to summarize an analysis on salmon bycatch estimation in the groundfish fisheries and upon which our recommendation is based. Staff will be prepared to provide further information on the analysis and respond to Council questions and concerns.

Sincerely,

Steven Penoyer
Steven Penoyer
Administrator, Alaska Region



federal register

Wednesday
February 4, 1998

Part II

Department of Commerce

**National Oceanic and Atmospheric
Administration**

50 CFR Part 679

**Fisheries of the Exclusive Economic
Zone Off Alaska; At-Sea Scales; Final
Rule**

DEPARTMENT OF COMMERCE

National Oceanic and Atmospheric Administration

50 CFR Part 679

[Docket No. 960206024-8008-03; I.D. 043097A]

RIN 0648-AG32

Fisheries of the Exclusive Economic Zone Off Alaska; At-Sea Scales

AGENCY: National Marine Fisheries Service (NMFS), National Oceanic and Atmospheric Administration (NOAA), Commerce.

ACTION: Final rule.

SUMMARY: NMFS amends the regulations implementing the Fishery Management Plan for Groundfish of the Gulf of Alaska and the Fishery Management Plan for the Groundfish Fishery of the Bering Sea and Aleutian Islands Area (FMPs) to establish performance, technical, operational, maintenance, and testing requirement for motion-compensated scales that may be required by NMFS to weigh catch at sea. This rule does not require vessels to weigh catch at sea. Any such requirements would be imposed by other rulemaking. This action is intended to promote the objectives of the FMPs.

DATES: Effective March 6, 1998, except § 679.28(b)(2)(iii)(B) which is not effective until the Office of Management and Budget approves the information collection requirement contained in that section. NMFS will publish a document in the *Federal Register* announcing the effective date for that section. NMFS will announce in the *Federal Register* the dates when NMFS will accept type evaluation documentation under 50 CFR 679.28(b)(1) and when scale inspections under 50 CFR 679.28(b)(2) will be conducted.

ADDRESSES: Send comments regarding burden estimates or any other aspect of the data requirements, including suggestions for reducing the burdens, to NMFS and to the Office of Information and Regulatory Affairs, Office of Management and Budget (OMB), Washington, DC 20503, Attn: NOAA Desk Officer and to Sue Salvesson, Assistant Regional Administrator, Sustainable Fisheries Division, Alaska Region, NMFS, P.O. Box 21668, Juneau, AK 99802, Attn: Lori J. Gravel, or delivered to the Federal Building, 709 West 9th Street, Juneau, AK.

FOR FURTHER INFORMATION CONTACT: Sally Bibb, 907-586-7228.

SUPPLEMENTARY INFORMATION:

Background

Fishing for groundfish by U.S. vessels in the exclusive economic zone of the Gulf of Alaska (GOA) and the Bering Sea and Aleutian Islands Management Area (BSAI) is managed by NMFS according to the FMPs. The FMPs were prepared by the North Pacific Fishery Management Council (Council) under authority of the Magnuson-Stevens Fishery Conservation and Management Act (Magnuson-Stevens Act). Fishing by U.S. vessels is governed by regulations implementing the FMPs at subpart H of 50 CFR part 600 and at 50 CFR part 679.

On June 16, 1997, NMFS published a proposed rule (PR) proposing to establish the performance, technical, operational, maintenance, and testing requirements for motion-compensated scales that may be required by NMFS to weigh catch at sea (62 FR 32564). Public comment was invited through July 16, 1997. Ten letters of comment were received.

The Response to Comments section below addresses only comments about the performance, technical, operational, maintenance, and testing requirements for scales used to weigh catch at sea. Some of the comments received on this PR were in response to a different PR that would require trawl catcher/processors and motherships participating in the Western Alaska Community Development Quota Program (CDQ) to weigh catch at sea using such scales (62 FR 43866, August 15, 1997). The end of the public comment period on that proposed rule was September 29, 1997. NMFS will respond to the following issues in the Response to Comments section in the preamble to the final rule resulting from that proposed rule: (1) Which vessels will be required to weigh catch on a scale, (2) whether scales should be required in particular fisheries or for particular vessel types, (3) whether additional scale testing is needed before NMFS requires vessels to use scales, (4) whether other types of catch-weight estimates could be used if a scale breaks down, (5) questions about the use of species composition sampling to estimate the weight of each species in the catch, and (6) the validity of NMFS cost estimates for scales on certain types of vessels.

This final rule adds a new § 679.28 to 50 CFR part 679, titled "Equipment and operational requirements for catch weight measurement" and adds a new appendix A to part 679. Besides setting forth the equipment, operational, maintenance, and testing requirements for such scales, § 679.28 sets forth the information that scale manufacturers

must submit to NMFS in order for a scale to be eligible for approval by NMFS to be used to weigh catch at sea. In addition, § 679.28 sets forth the responsibilities of vessel owners and operators with respect to initial after-installation scale inspections and annual reinspections, and it also sets forth at-sea testing requirements and recordkeeping and reporting requirements. The new appendix A to part 679 sets forth the performance and technical requirements for type evaluation and initial and annual reinspections for belt-conveyor (flow) scales, automatic hopper scales, platform scales, and hanging scales.

Section 679.28 and appendix A to this part do not impose any requirement on vessels or processors to weigh catch at sea. Any such requirement would be imposed by other rulemakings. For example, NMFS has proposed in a separate rulemaking that trawl catcher/processors and motherships be required to weigh all CDQ catch and that all processor vessels, including those using trawl, longline, and pot gear, provide an observer sampling station which includes a motion-compensated platform scale (62 FR 43866, August 15, 1997). If the proposal is adopted, these weighing and scale requirements would be codified in § 679.32 with other regulations governing monitoring of the CDQ program. All scales used would have to be approved by NMFS under § 679.28 and appendix A to this part.

Response to Comments

Comment 1: The proposed at-sea scale requirements are very different from scale certification requirements for shoreside processors. Scales in shoreside plants are required to be certified annually by the Alaska Division of Measurement Standards but are not required to be tested between annual certifications. Specifically, they are not required to meet accuracy standards in daily tests. NMFS should not implement at-sea scale requirements until parallel requirements are implemented by the State of Alaska for scales used to weigh federally managed species in shorebased processing plants in Alaska.

Response: Scales in shoreside processing plants are under the jurisdiction of the State of Alaska Division of Measurement Standards because the buying and selling of fish is commerce, and the State of Alaska requires that these fish be weighed on a scale approved under Alaska Statutes. The State of Alaska determines what constitutes an approved scale, how often the scale has to be tested, what tests must be conducted, and what

accuracy standards must be met. Scales in shoreside plants must meet significantly more restrictive performance requirements—maximum permissible errors (MPEs)—and are operated in a less hostile environment than those at sea.

NMFS believes it is unnecessary to have identical requirements for scales in the shoreside plants and scales on vessels. The environment in which the weighing occurs is different, and, therefore, the design of the land-based versus at-sea scales is different. Once calibrated and sealed, land-based scales are expected to hold their calibration over an extended period of time. However, some motion-compensated belt scales are specifically designed to be recalibrated regularly in order to weigh accurately. Because the operator must adjust the scale several times a day, NMFS believes that a daily test of the scale is necessary to monitor the performance of the scale.

NMFS may re-evaluate the need for daily tests for at-sea scales in the future if scales with sealed calibration mechanisms are available or if daily scale test results indicate that fewer tests would provide sufficient information about the scale's performance.

Comment 2: NMFS should not implement requirements that vessels be required to weigh catch on a scale evaluated under § 679.28(b) until NMFS demonstrates that at-sea scales are capable of weighing accurately on specific vessels or classes of vessels defined by length categories or processing modes, e.g., catcher/processors that head, gut, and freeze (H&G).

Response: This rule does not require any vessel to weigh catch at sea. Such requirements are the subject of other rulemakings. Rather, this rule establishes performance and technical requirements for scales used to weigh catch at sea, from platform scales used to weigh observers' samples to high capacity scales used to weigh total catch. Questions such as whether at-sea weighing is necessary, which vessels would be required to weigh catch, and whether back-up methods can be used when a scale breaks down are being addressed in other rulemakings. The technical and performance requirements for scales used at sea need to be issued as soon as possible so that scale manufacturers can prepare for future scale requirements.

Comment 3: NMFS should use the term "approved for use" rather than "certified" to refer to a scale that has met laboratory and dockside inspection and test requirements to be consistent

with the terms used by weights and measures agencies.

Response: NMFS concurs with the suggestion. This final rule refers to scales that have met laboratory and initial or annual inspection requirements as "approved for use" rather than "certified." Once a scale is approved for use, it must also pass daily at-sea scale test requirements in order to be used to weigh catch at sea.

Comment 4: Testing the scale in a laboratory or on a vessel tied up to a dock will not verify whether the scale weighs accurately in motion. These tests can only be performed once the scale has been purchased and installed on the vessel, successfully evaluated in the laboratory and by a scale inspector, and used in a commercial fishery. A scale could pass laboratory and dockside inspection requirements but fail the at-sea scale tests. Failure of the scale at this point would be costly to the vessel owner in terms of scale installation and purchase costs, as well as of loss of time in a commercial fishery.

Response: NMFS is implementing a three-part process for evaluating whether at-sea scales are meeting NMFS' performance and technical requirements. This process consists of type evaluation of each model of scale, dockside inspection of each scale once installed on a vessel and once a year thereafter, and at-sea testing of each scale. No single element of the process alone is sufficient to determine whether a scale is meeting performance and technical requirements.

The laboratory tests are designed to determine whether the model of scale meets technical and performance standards under a range of environmental and operating conditions on the vessel, including temperature, humidity, power fluctuations, short-time power reduction, power bursts, electrostatic discharge, and electromagnetic susceptibility. However, the laboratory tests are not designed to test the scale's performance in motion.

The dockside inspection of each scale will determine, among other things, whether the scale weighs accurately while in a nearly stationary position. This evaluation is necessary to identify scales that are not installed properly or do not meet other technical or performance requirements before the vessel starts fishing.

The at-sea scale tests will be conducted daily to verify that the scale is weighing accurately at sea. This is the only test that will be performed while the scale is in motion. The MPEs are higher in the at-sea scale tests than in

the dockside tests to allow a greater tolerance for scales tested in motion.

NMFS considered the need for laboratory tests that would verify whether a scale could weigh accurately in motion and agrees that, if such tests existed, they would provide valuable information about a scale's performance. Unfortunately, laboratory tests specifically designed to test at-sea scales in motion do not exist, and it would be very costly and time consuming for NMFS to develop laboratory tests that could accurately reproduce the motion and other environmental conditions experienced by a vessel.

Although more extensive laboratory tests could provide more information about the performance of a scale, the at-sea scale tests would still be the official test of the scale's performance in motion. It is possible that a scale could pass laboratory and dockside inspection requirements but fail daily at-sea scale tests. Scale manufacturers must understand the conditions under which their scale will be used to accurately specify the performance capabilities of their scales and to provide the necessary performance guarantees to their customers. Vessel owners are responsible for proper installation and maintenance of the scale according to the manufacturer's instructions.

Comment 5: In rough weather, some vessels may pitch and roll so much that the fish being conveyed through the factory will slide across the belt or be lifted off the belt. Laboratory tests would not determine how the belt scale will function if fish are not in contact with the weighing plate of the scale. Do NMFS certification tests tell us if the scale will work if fish are not continually in contact with the belt itself or are moving against the flow direction of the conveyor belt because of the extreme motion of a vessel?

Response: Laboratory tests are probably not needed to determine how a belt scale would function under these circumstances because the scale is not designed to weigh accurately if fish are sliding across the scale's conveyor belt or are being lifted off the belt while they are being weighed. If fish are sliding forward across the scale or are being lifted off the scale when the vessel pitches, catch weight probably would be underestimated. If fish are sliding backwards across the scale, catch weight probably would be overestimated.

The scale is required to be tested once a day by the vessel crew at a time determined by the crew. NMFS acknowledges that these daily scale tests cannot identify all weighing problems that will occur between tests on successive days. However, other

features of the scale program should minimize this risk. These other features include the type evaluation, and dockside tests, and the audit trail that electronically records and stores records of scale calibrations, adjustments, and observer monitoring.

The vessel operators and scale manufacturers must decide whether a particular type of scale or model of scale will be able to weigh accurately under the conditions that will be experienced by the vessel. If a vessel regularly fishes in circumstances where a belt scale is not advisable, the owner or operator should consider installing an automatic hopper scale in which fish are conveyed into the hopper of the scale, which is a partially enclosed container, and weighed in batches rather than being weighed as they flow across a scale.

Comment 6: NMFS should require scale manufacturers to post a performance bond.

Response: NMFS will not require that scale manufacturers post a performance bond to guarantee that their scales will meet NMFS' requirements at sea. Arrangements to compensate vessel owners for problems with the scales should be specified in a contract between the scale manufacturer and the vessel owner without involvement by NMFS.

Comment 7: Can laboratory tests required by NMFS be conducted at laboratories in the United States?

Response: Yes, influence factors tests for static temperature (annex A, A.3.1 to appendix A to part 679), damp heat, steady state (appendix A, annex A, A.3.2), and power voltage variation (appendix A, annex A, A.3.3) can be conducted by laboratories accredited under the National Type Evaluation Program (NTEP). The west coast NTEP laboratory is located in Sacramento, CA, telephone 916-229-3000. The NTEP laboratory also can refer scale manufacturers to other laboratories that have the capability to conduct disturbance tests.

Comment 8: NMFS should allow a combination of NTEP approval on components and a history of scale use in a shoreside processing plant in lieu of type evaluation requirements.

Response: NMFS does not agree with this suggestion in its entirety, but will accept NTEP Certificates of Conformance and test results to be submitted in partial fulfillment of the type evaluation requirements. Section 679.28(b)(1)(iv) has been revised accordingly.

The NTEP Certificate of Conformance requires that a component or device undergo only one or two of the seven laboratory tests recommended for at-sea

scales by our technical advisor (temperature and power voltage fluctuation). The additional five tests are recommended for at-sea scales because they represent the type of external factors present on a vessel that may affect the scale's performance. A history of use of a similar model of scale in a shoreside processing plant does not offer NMFS the assurances it needs that the scale is designed to operate successfully on a vessel.

Comment 9: NMFS should accept International Organization of Legal Metrology (OIML) Certificates of Conformance for all types of scales covered by appendix A to part 679, rather than just for belt scales.

Response: NMFS agrees and has revised § 679.28(b)(1)(iv) to specify OIML certificates and test results for automatic hopper scales, platform scales, and hanging scales as acceptable verification of test results. Scale manufacturers who submit NTEP or OIML Certificates of Conformance must also submit all other information required by NMFS listed in § 679.28(b)(1)(i) and (b)(1)(ii).

Comment 10: Will NMFS accept an OIML Certificate of Conformance on a land-based version of the motion-compensated scale?

Response: Yes, NMFS will accept OIML Certificates of Conformance and test data if they are based on tests of a model of scale without motion compensation as long as the model of scale that was tested and the model of scale that will be used to weigh catch at sea differ only in the elements of the scale that are designed to perform motion compensation, the size or capacity of the scale, and the software used by the scale. Section 679.28(b)(1)(ii)(C) was added to the final rule in order to clarify this allowance.

Comment 11: Vessel owners need an alternative to the weights and measures inspectors that would be provided through NMFS' cooperative agreement with the State of Alaska, Division of Measurement Standards. Alternative weights and measures inspectors are needed in case NMFS cannot provide scale inspectors when and where they are needed by the vessel owners. NMFS could specify the qualifications and training requirements for the inspectors, and the industry could contract directly with the alternative scale inspectors.

Response: Section 679.28(b)(2)(iii)(B) was added to the final rule in order to authorize inspectors other than those employed by the State of Alaska to conduct initial and periodic inspections of at-sea scales. NMFS will not pay any of the costs associated with these inspections. A person wishing to

conduct scale inspections must be an employee of a U.S., state, or local weights and measures agency. He or she must be trained to conduct the inspection by NMFS' authorized scale inspectors and must notify NMFS in writing that he or she meets the previous two requirements prior to conducting any inspections. Such person must provide NMFS with at least 3 days notice that a scale inspection will be conducted in order to provide NMFS employees with an opportunity to observe the inspection. This section is not yet effective; OMB must first approve the collection of information requirements. The section's effectiveness will be announced by notice in the **Federal Register**.

Comment 12: NMFS needs to clarify where scale inspections could occur, because the preamble to the PR says that inspections would occur in Seattle, WA, or Dutch Harbor, AK, but the regulations do not limit inspections to these two ports. In addition, NMFS should provide for scale inspections in Kodiak because these regulations could apply to vessels in the Gulf of Alaska in the future.

Response: Section 679.28(b)(2)(v) has been added to the final rule in order to clarify that inspections by inspectors paid for by NMFS must be conducted only in the Puget Sound area of Washington State and Dutch Harbor, AK. This restriction is necessary to stay within the budget NMFS has allocated for the scale inspection program. NMFS will consider amending these regulations to allow scale inspections in other ports if the demand exists and the budget can be increased. One possible option would be to allow inspections in other ports if vessel owners pay for the cost of travel and transportation of equipment from Seattle, WA, or Dutch Harbor, AK, to the port in which the scale inspection is requested.

NMFS also may propose to limit scale inspections to certain months of the year if necessary to perform all scale inspections within budget limits.

Comment 13: NMFS should pre-approve scale installation plans.

Response: NMFS will review scale installation plans with vessel owners and discuss installation, performance, and technical requirements. However, NMFS cannot approve the vessel owner's plans. Determination of whether a scale meets NMFS requirements can only be determined once the scale is installed and in use.

Comment 14: NMFS should give a 1-month grace period for annual inspections. The purpose of this would be to increase the scheduling flexibility for both NMFS and vessel owners

without resulting in a situation where the vessel is required to undergo the inspection more than once per year.

Response: The final regulations require that the scale be inspected and tested by an inspector authorized by NMFS when it is first installed (initial inspection) and one time each year within 12 months of the date of the most recent inspection. This means that a scale that passes the inspection requirements on May 1, 1998, would not be required to pass the inspection requirements again until May 1, 1999. Because no scale must be inspected more than once in a 12-month period, a 1-month grace period is not necessary. Vessel owners may schedule their second inspection for a date less than 12 months from the initial inspection so that future annual inspections may occur during a more convenient time of the year. See the response to comment 15 for additional information.

Comment 15: NMFS should grant a trip-by-trip exemption if an inspector is not available.

Response: NMFS intends to establish a scale inspection program that will provide inspectors when they are needed within 10 working days of the date the request for a scale inspection is received. Vessel owners are encouraged to plan ahead in order to ensure that they obtain an annual inspection prior to the deadline.

Comment 16: The proposed MPE of 3 percent for at-sea scale tests is too high. Scales could and should achieve better than that at sea.

Response: A 3-percent MPE was proposed as a compromise between what scale manufacturers said they could achieve and what NMFS believed would be acceptable for fisheries management purposes. NMFS did not want to propose an MPE so restrictive that it would cause scales to regularly fail at-sea tests. Tests conducted on a belt conveyor scale between August 1996 and March 1997 showed that a 1.5-percent MPE could be met in most cases but that a 3-percent MPE was not exceeded in any test. NMFS will maintain the MPE for belt and automatic hopper scales at 3 percent, and may re-evaluate the 3-percent MPE in the future if at-sea scale test results indicate that better performance can practically be achieved. See the response to comment 17 about MPEs for platform and hanging scales.

Comment 17: The MPE for at-sea tests of the platform and hanging scales should be reduced from 3 percent to 0.5 percent because these types of scales can meet more restrictive MPEs at sea. In addition, many of the platform scales will be used to weigh test material for

testing the belt or automatic hopper scales. If the allowable error in the scale used to weigh test material is 3 percent, then a cumulative error of 6 percent could be allowed for the belt and automatic hopper scales.

Response: NMFS agrees and has revised § 678.28(b)(3) accordingly.

Comment 18: The MPE for belt and automatic hopper scales at initial and periodic inspections should be 1 percent.

Response: Section 2.2.1.3 (belt scales) and section 3.2.1.2 (automatic hopper scales) of appendix A to part 679 specify that the MPE for material tests and increasing and decreasing load tests conducted in a laboratory or on a scale installed on a stationary vessel is 1 percent. The MPE for at-sea tests of belt and automatic hopper scales is 3 percent.

Comment 19: NMFS needs to clarify what information is required on the scale's "audit trail."

Response: The audit trail is an electronic and printed record of changes that are made to the scale or the scale weights by the scale operator. Appendix A to part 679 requires that when a scale is adjusted or calibrated, either a security seal must be broken or an audit trail must be provided. Changes in adjustable components, such as span (calibration) and automatic zero-setting, that affect the performance or accuracy of the scale must be recorded on the audit trail.

NMFS has revised the regulations and annex A to appendix A in order to clarify that the information on the audit trail must be provided in an electronic form that cannot be changed or erased by the scale operator, can be printed at any time, and can be cleared by the scale manufacturer's representative upon direction by NMFS or by an authorized scale inspector.

NMFS removed the requirement that "a unique identifying number from 000 to 999 to identify the type of adjustment being made to any parameter that affects the performance of the scale" be recorded on the audit trail. The requirement to record the date and time of each adjustment will provide sufficient information about the chronological order of adjustments. NMFS also removed the requirement that the "source of the change" be provided on the audit trail. This referred to the identification of the person making the change which, upon consultation with our technical advisor and scale manufacturers, NMFS determined was not meaningful information to require.

If the adjustment recorded on the audit trail is a scale calibration

performed by the scale operator, the audit trail would record the date and time the calibration procedure was performed, the name or type of adjustment being made, such as "span adjustment" or "calibration," and the initial and final values of the parameter changed.

The final rule has also been changed to add the requirement that any information to be provided on the audit trail be described in the "information about the scale" submitted to NMFS under § 679.28(b)(1)(ii)(H) and to add the definition of "adjustable component" to section 5 of appendix A to part 679.

Comment 20: Can the information on the audit trail be printed on a remote computer that captures the data from the scale?

Response: Yes. Information on the audit trail is required to be recorded and retained in memory until it is cleared from memory at the annual inspection. The information is not required to be displayed on the scale indicator. However, the scale system must include the capability to print the information on the audit trail at any time upon request of the observer, the scale inspector, NMFS staff, or an authorized officer.

Comment 21: Can the printed information required in sections 2.3.1.8, 3.3.1.7, and 4.3.1.5 of appendix A to part 679 be provided by an auxiliary printer connected to the scale?

Response: The printed information could come from either a printer that is connected directly to the scale or that is connected through another computer on the vessel.

Comment 22: The proposed rule would appear to allow the scale operator to recalibrate the scale every day just prior to the scale test. This would render the test valueless because a scale could be operated with as great as 10 percent error for 24 hours and still satisfy NMFS requirements.

Response: NMFS does not agree with this comment. The scales are required to be adjusted so that the error is as close as possible to zero, which means that vessel operators are prohibited from deliberately adjusting the scale incorrectly. Although scales may be recalibrated or tested at any time during the day, the audit trail is designed to record information that will be used to determine whether a scale had been incorrectly adjusted and then readjusted just prior to the scale test.

Comment 23: NMFS needs to clarify the difference in requirements for different uses of platform scales.

Response: Platform scales could be used for two different purposes on a

vessel. First, a platform scale could be used as an observer sampling scale and to verify the weight of fish used to test the belt or automatic hopper scales on trawl catcher/processors and motherships. In this case, the scale will not be required to provide printed output of scale weights because all information from the scale weights will be recorded by hand on the observer's forms or on the scale test report form. In addition, the platform scale will not be required to provide an audit trail of all adjustments to the scale. The purpose of the audit trail for scales used to weigh total catch is to monitor whether the scale is being improperly adjusted so that weights are incorrectly reported. An audit trail is not necessary for a scale used primarily by the observer or witnessed by the observer during a scale test because the observer can test the scale immediately prior to use to verify its accuracy.

Second, a platform scale could be used to weigh total catch. In this case, the scale would be required to meet all of the performance and technical requirements specified in § 679.28(b) and section 4 of appendix A to part 679.

For all uses of a platform scale, the scale is required to meet type evaluation requirements and to be inspected and approved by an authorized scale inspector upon initial installation and each year thereafter. In addition, the vessel owner is required to provide certified test weights as described in § 679.28(b)(3)(ii)(B) for the daily scale tests at sea.

Comment 24: In appendix A to part 679, sections 2.3.1.5 and 3.3.1.9, NMFS proposes to require that belt scales and automatic hopper scales be capable of indicating at least 99,999,999 kilograms so that the cumulative weight of all catch in a year could be displayed on the indicator. Scales currently on the market cannot display this many digits.

Response: NMFS has revised sections 2.3.1.5 and 3.3.1.9 of appendix A to part 679 to allow the information required on the scale indicator to be displayed in either kilograms or metric tons. These sections now read: "the range of the weight indications and printed values for each haul or set must be from 0 kg to 999,999 kg and for the cumulative weight must be from 0 to 99,999 metric tons." This revision allows the cumulative catch of all material weighed on the scale to be displayed in less space.

NMFS also revised the wording in several other sections of appendix A to part 679 to make other requirements consistent with the changes in sections 2.3.1.5 and 3.3.1.9.

Sections 2.3.1.1 and 3.3.1.1 were revised to replace technical terms with plain English. For example, the first two sentences of section 2.3.1.1 previously read, "a belt scale must be equipped with a primary indicator in the form of a master weight totalizer, a printer, and a rate of flow indicator. It must also be equipped with auxiliary means to indicate or print values for specified partial loads." Section 2.3.1.1 has been revised to read, "a belt scale must be equipped with an indicator capable of displaying both the weight of fish in each haul or set and the cumulative weight of all fish or other material weighed on the scale between annual inspections ('the cumulative weight'); a rate of flow indicator; and a printer." Section 3.3.1.1 has been revised similarly.

Sections 2.3.1.3 and 3.3.1.3 have been revised to read, "the weight of each haul or set must be indicated in kilograms and the cumulative weight may be indicated in kilograms or metric tons and decimal subdivisions."

Section 2.3.1.6 has been revised to read, "the means to indicate the weight of fish in each haul or set must be resettable to zero. The means to indicate the cumulative weight must not be resettable to zero without breaking a security means and must be reset only upon direction by NMFS or an authorized scale inspector." Section 3.3.1.10 has been revised to read, "the cumulative weight must not be resettable to zero without breaking a security means and must be reset only upon direction by NMFS or an authorized scale inspector."

Comment 25: NMFS should allow limited component exchange for load cells without requiring that the scale be re-evaluated at a laboratory.

Response: NMFS agrees that metrologically equivalent load cells from the same or a different manufacturer may be installed into a scale without requiring that scale to be resubmitted for laboratory tests or retested by a scale inspector. However, a materials test should be conducted immediately after replacing the load cell to assure that the scale is weighing accurately.

Comment 26: NMFS should clarify the definition of a major modification that would require a scale to be inspected by an authorized scale inspector between annual inspections.

Response: It would be difficult for NMFS to distinguish between scale modifications that should require re-inspection versus those that should not. Therefore, NMFS is requiring only that the scales be inspected when they are first installed on a vessel and at least

one time per year thereafter. Between annual inspections, NMFS will rely on the daily scale test requirement to determine whether a scale is weighing accurately after scale modifications.

Comment 27: For automatic hopper scales, NMFS should allow the option of having the scale return to zero after weighing each hopper of fish rather than requiring the scale to print the load and no-load reference values for each hopper load because this provision is allowed for automatic hopper scales used in shoreside plants.

Response: NMFS revised section 3.3.1.1 of appendix A to part 679 to allow this option for automatic hopper scales.

Comment 28: A material test should be used to test both belt scales and automatic hopper scales at sea. The material used in the test should be weighed immediately before or after the test to establish its true weight, regardless of whether this material is fish or an alternative (such as sand bags).

Response: NMFS agrees and has revised the requirements for at-sea scale tests in § 679.28(b)(3) accordingly.

Comment 29: The overload protection requirement should be increased from 150 percent to 200 percent because of the extra stress on scales used at sea.

Response: Increasing the overload protection requirement for the scales is unnecessary. Loads in excess of 150 percent of the capacity of the scale should not normally accumulate on the scale. In the event that they do, the scale should be recalibrated before it is used to weigh more fish.

Comment 30: Stating specific sizes of scales under the definition of a platform scale may unintentionally favor specific scale manufacturers.

Response: Scale dimensions were included as examples representative of some scales in use, but were not intended to specify designs of any particular manufacturer, nor to preclude the design of a manufacturer. NMFS has removed this particular sentence from the definition.

Comment 31: Can a "security means" be a password needed to enter the indicator that will be known only to the inspector and that can be changed only by the inspector?

Response: This comment refers to the requirement in sections 2.3.1.11, 3.3.1.12, and 4.3.1.8 of appendix A to part 679 which states that "an adjustable component that can affect the performance of the scale must be held securely in position and must not be capable of adjustment without breaking a security means, unless a record of the adjustment is made on the audit trail

* * * " Because it would be impossible for NMFS to determine if the password needed to make a scale adjustment was known to the vessel crew, a password would not be considered a "security means." Therefore, any feature of the scale that could be changed by entering a password prior to making the change is required to be recorded on the audit trail. NMFS also revised the definition of "security seals or means" in section 5.0 of appendix A to part 679 in order to be consistent with this response to comment 31. In the PR, the definition read, "a physical seal such as a lead and wire seal or a key or code that when a change is made in the operating or performance characteristics of a scale it becomes evident." The definition now reads "a physical seal such as a lead and wire seal that must be broken in order to change the operating or performance characteristics of the scale."

Comment 32: The conveyors on belt scales are run by electricity rather than hydraulics, which is used for other conveyors on the vessel. Therefore, the scales will be less robust than regular conveyor belts. The electricity-driven belts will pose both safety and breakdown problems. In addition, scales will be exposed to more sand and grit on vessels that head, gut, and freeze groundfish than they would on vessels fishing for pollock, making durability a greater concern. Scales should not be required on H&G vessels until hydraulically operated belt scales are available.

Response: NMFS is setting the performance and technical standards for scales, specifying the fisheries in which scales are required, and will monitor the use of scales in these fisheries. NMFS cannot guarantee that scales will be able to operate on all fishing vessels under all sea conditions. It is the responsibility of vessel owners who wish to participate in these fisheries and of the scale manufacturers to make sure that they have installed a scale that is capable of meeting NMFS' standards. The decision of how a scale or a component of a scale is powered on a vessel should be made by the scale manufacturers and the vessel operators.

Comment 33: Fish should be used in the initial evaluation of the scale conducted by the scale inspector.

Response: NMFS agrees that it is most desirable to use the same material that will be weighed by the scale in material tests of the scale. However, it would be very difficult to make fish available for scale tests that are most likely to occur outside commercial fishing seasons and in ports far from where the fish are harvested. It is also very difficult and expensive to require inspectors to

conduct scale tests on a vessel after it starts fishing. Therefore, NMFS believes that the only option will be to conduct the material tests in the laboratory and at dockside with an alternative material that simulates the flow of fish as much as possible.

Comment 34: Section 2.2.2 of appendix A to part 679 specifies a minimum flow rate for belt scales. What is required of the scale if it is weighing below the minimum flow rate?

Response: Section 2.2.2 requires that the manufacturer specify the minimum flow rate for the scale and that the scale produce an audio or visual signal when the rate of flow is less than the minimum flow rate or greater than 98 percent of the maximum flow rate. NMFS is not requiring that the scale stop operating if the alarm indicates that the scale is operating below the minimum flow rate. However, the scale operator should correct the situation because the scale is not being operated according to the manufacturer's specifications.

Comment 35: How long must the zero load test required in section 2.2.1.2 of appendix A to part 679 be performed?

Response: Section 2.4.2.2 of appendix A to part 679 requires that the zero load test be conducted for a time equal to that required to deliver the minimum totalized load, which will depend on the capacity and belt speed of the individual scale.

Changes From the Proposed Rule

In addition to the changes discussed in the preceding responses to comments and editorial corrections and minor changes for grammar, consistency of word usage, and clarity, NMFS has made the following changes from the proposed rule:

1. NMFS added the following sentence to § 679.28(b)(2)(iv) to more clearly state the responsibility of the vessel owner in providing advance notice of the need for a scale inspection: "[v]essel owners must request a scale inspection at least 10 working days in advance of the requested inspection by contacting an authorized scale inspector at the address indicated on the list of authorized inspectors."

2. NMFS added the requirement in § 679.28(b)(3)(ii)(B) that the weight of each test weight must be certified by a National Institute of Standards and Technology approved metrology laboratory and that a copy of the laboratory certification documents be maintained on board the vessel at all times while the scale is required. This requirement is necessary in order to accurately determine the weight of the

test weights which will be used to calibrate and test scales at sea.

3. NMFS revised § 679.28(b)(2)(vii) to require that the vessel owner maintain a copy of the scale inspection test report form on the vessel rather than submit a copy to NMFS. NMFS will receive a copy of this report form from the scale inspectors.

4. NMFS revised § 679.28(b)(3), (b)(4), and (b)(5) to clarify that both the vessel owner and the vessel operator are responsible for ensuring that the daily scale tests are conducted, that adjustments made to the scale bring the performance errors as close as practicable to a zero value, and that the required printed reports are provided.

5. NMFS added § 679.28(b)(5)(i) to clarify that scale weights may not be adjusted to account for the perceived weight of water, mud, dirt, or other non-fish material. The scale must display, record, and print the weight of the material being weighed. Sections 2.3.1.13 and 3.3.1.16 of appendix A to part 679, titled "Adjustments to Scale Weights," were added to read: "The indicators and printer must be designed so that the scale operator cannot change or adjust the indicated and printed weight values."

6. NMFS added § 679.28(b)(6) to require that the observer be able to see the product on the scale and the scale indications at the same time. This section prevents the scale indicator, which displays the scale weights, from being installed somewhere on the vessel where it could not be watched as fish were being weighed.

7. NMFS revised section 2.2.1.2 of appendix A to part 679 in order to clarify its meaning. The requirement in the PR was that "the MPE for zero load tests conducted in a laboratory or on a scale installed on a stationary vessel is ± 0.1 percent or 1 scale division (d)." NMFS revised the last part of this sentence to read " +0.1 percent of the value of the minimum totalized load or 1 scale division (d), whichever is greater."

8. NMFS revised the last sentence of sections 2.2.1 and 3.2.1 of appendix A to part 679 in order to be consistent with § 679.28(b)(2)(i) which states that scale inspections will be conducted on a vessel tied up at a dock. In the PR, sections 2.2.1 and 3.2.1 of appendix A to part 679 read, "a stationary vessel refers to a vessel that is tied up at a dock or anchored near shore and is not under power at sea." NMFS removed "or anchored near shore."

9. NMFS revised the requirements for the information from the scales used to weigh total catch that must be printed each day (sections 2.3.1.8, and 3.3.1.7 of

appendix A to part 679). These revisions added the requirements to print vessel name, the value of the cumulative catch recorded on the totalizer, and the date and time the information is printed. The following information is required to be printed each day:

- i. The vessel name;
- ii. The Federal fisheries or processor permit number of the vessel;
- iii. The haul or set number;

iv. Month, day, year, and time (to the nearest minute) weighing catch from the haul or set started;

v. Month, day, year, and time (to the nearest minute) weighing catch from the haul or set ended;

vi. The total weight of catch in each haul or set;

vii. The total cumulative weight of all fish or other material weighed on the scale; and

viii. The date and time the information is printed.

10. NMFS added a sentence in section 2.2.1.1 c. of annex A to appendix A to part 679 in order to change the temperature effect at zero flow rate from 10° C to 10° C ± 0.2° C.

Following is an example of how the information required to be printed each day could be presented for the first day that weighing on the scale occurs:

Vessel Name: _____ Federal Permit #: _____

Haul or set number	Date	Time		Haul or set weight (kg)
		Weighing started	Weighing stopped	
1	1/1/98	0200	0500	50,000
2	1/1/98	0600	0900	50,000
3	1/1/98	1600	1900	50,000
Cumulative weight	1/1/98	N/A	N/A	150,000

Date and time information printed: 1/1/98, 2100 hrs.

Signature of vessel operator: _____

10. In section 2.3.4 of appendix A to part 679, the value of the scale division (d) was added to the list of marking requirements. In section 3.3.6, the accuracy class and the value of the scale division (d) were added to the list of marking requirements.

11. Section 4.2.1 of appendix A to part 679 was revised to clarify and correct the sections referring to MPEs in type evaluation and initial and periodic inspections. Table 1 was also revised to delete the last column of MPEs for "in-service." In-service refers to the time when the scale is in use at sea, and this MPE is already specified in § 679.28(b)(3). Table 2 was added to section 4.2.2 of appendix A to part 679 to define the accuracy classes referred to in table 1 to appendix A.

12. In section 4.2.3 of appendix A to part 679, two typographical errors were corrected. "Class III scale 10 d" should have read, "Class III scale 10d." The weights and measures industry uses "III" rather than the Roman numeral IV to refer to a class four scale.

13. The word "sealable" was deleted from the definition of "event logger" because the parameters being recorded by the event logger are parameters that cannot be sealed. The definition also was revised to make it consistent with the changes made to the audit trail described in the response to comment 19.

Classification

This final rule has been determined to be not significant for purposes of E.O. 12866.

When this rule was proposed, the Assistant General Counsel for Legislation and Regulation of the Department of Commerce certified to the Chief Counsel for Advocacy of the Small Business Administration that it would not have a significant economic impact on a substantial number of small entities. The rationale for this determination appeared in the preamble to the proposed rule. NMFS received one comment regarding this certification. However, the comment was in reference to a different proposed rule which would require trawl catcher/processors and motherships participating in the CDQ fisheries to use a scale approved by NMFS. NMFS will respond to this comment in the comment section of the relevant rulemaking. No comments were received regarding the forms for the certification. Accordingly, no regulatory flexibility analysis was prepared.

Notwithstanding any other provision of the law, no person is required to respond to, nor shall any person be subject to a penalty for failure to comply with, a collection-of-information subject to the requirements of the PRA, unless that collection-of-information displays a currently valid OMB control number.

This rule contains collection-of-information requirements subject to the Paperwork Reduction Act. A request has been submitted to OMB for approval of a requirement that inspectors from agencies other than an agency designated by NMFS submit written verification that they have completed training requirements prior to conducting a scale inspection. The

public reporting burden for this proposed requirement is estimated to average 30 minutes per response. Inspectors from agencies other than the weights and measures agency designated by NMFS to perform scale inspections on behalf of NMFS must notify the Regional Administrator of the date, time, and location of the scale inspection at least 3 working days before the inspection is conducted. The public reporting burden for this requirement is estimated to average 2 minutes per notice.

Public comment is sought regarding: Whether this collection of information is necessary for the proper performance of the functions of the agency, including whether the information has practical utility; the accuracy of the burden estimate; ways to enhance the quality, utility, and clarity of the information to be collected; and ways to minimize the burden of the collection of information, including through the use of automated collection techniques or other forms of information technology.

The other collections of information in this rule have been approved by the Office of Management and Budget, OMB control number 0648-0330. The new information requirements include the following: (1) Scale manufacturers must submit completed At-Sea Scales Type Evaluation Certification documents to the Regional Administrator prior to being placed on the list of eligible at-sea scales; (2) vessel owners must maintain a copy of the scale certification document issued by a scale inspector

approved by the Regional Administrator to NMFS prior to participating in a fishery in which a certified at-sea scale is required; (3) vessel operators must maintain a record of the results of daily at-sea scale tests; (4) vessel operators must maintain printed output from the scale; and (5) vessel operators must print information from the scale's audit trail once per year. The public reporting burden for this collection of information is estimated to average 176 hours per response for the type evaluation certification documents, 1 minute per response to maintain the scale certification on the vessel, 45 minutes per response for the at-sea scale tests, 5 minutes per response for the printed output from the scale, and 3 minutes per response for the printed audit trail. These estimates include the time for reviewing instructions, searching existing data sources, gathering and maintaining the data needed, and completing and reviewing the collection of information. Send comments regarding these burden estimates or any other aspect of the data requirements, including suggestions for reducing the burden, to NMFS (see ADDRESSES) and to the Office of Information and Regulatory Affairs, OMB, Washington, DC 20503 (Attention: NOAA Desk Officer).

List of Subjects in 50 CFR Part 679

Alaska, Fisheries, Reporting and recordkeeping requirements.

Dated: January 23, 1998.

David L. Evans,

Deputy Assistant Administrator for Fisheries,
National Marine Fisheries Service.

For the reasons set out in the preamble, 50 CFR part 679 is amended as follows:

PART 679—FISHERIES OF THE EXCLUSIVE ECONOMIC ZONE OFF ALASKA

1. The authority citation for part 679 continues to read as follows:

Authority: 16 U.S.C. 773 *et seq.*, 1801 *et seq.*, and 3631 *et seq.*

2. In subpart B, § 679.28 is added to read as follows:

§ 679.28 Equipment and operational requirements for catch weight measurement.

(a) *Applicability.* This section contains the requirements for NMFS approval of scales used to weigh catch at sea and other requirements relating to such scales. This section does not require any vessel to weigh catch at sea. Such requirements appear elsewhere in this part.

(b) *Scales used to weigh catch at sea.* In order to be approved by NMFS a scale used to weigh catch at sea must meet the type evaluation requirements set forth in paragraph (b)(1) of this section and the initial inspection and annual reinspection requirements set forth in paragraph (b)(2) of this section. Once a scale is installed on a vessel and approved by NMFS for use to weigh catch at sea, it must be reinspected annually and must be tested daily and meet the maximum permissible error (MPE) requirements described in paragraph (b)(3) of this section.

(1) *List of scales eligible for approval.* The model of scale must be included on the Regional Administrator's list of scales eligible to be approved for weighing catch at sea before an inspector will schedule or conduct a scale inspection under paragraph (b)(2) of this section. A scale will be included on the list when the Regional Administrator receives the information specified in paragraphs (b)(1)(i) through (iv) of this section. This information identifies and describes the scale, sets forth contact information regarding the manufacturer, and sets forth the results of required type evaluations and testing. Type evaluation and testing must be conducted by a laboratory accredited by the government of the country in which the tests are conducted.

(i) *Information about the scale.* (A) Name of scale manufacturer.

(B) Name of manufacturer's representative.

(C) Mailing address of scale manufacturer and manufacturer's representative.

(D) Telephone and fax number of manufacturer's representative.

(E) Model and serial number of the scale tested.

(F) A written description of the scale and diagrams explaining how the scale operates and how it compensates for motion.

(G) A list of the model numbers of all scales for which type evaluation results are applicable, identifying the differences between the model evaluated in the laboratory and other models listed. The scales may differ only in the elements of the scale that perform motion compensation, the size or capacity of the scale, and the software used by the scale.

(H) A list of types of scale adjustments that will be recorded on the audit trail, including the name of the adjustment as it will appear on the audit trail, and a written description of the adjustment.

(ii) *Information about the laboratory.*

(A) Name of laboratory.

(B) Mailing address of laboratory.

(C) Telephone and fax number of laboratory's representative.

(D) Name and address of government agency accrediting the laboratory.

(E) Name and signature of person responsible for evaluation of the scale and the date of signature.

(iii) *Checklist.* A completed checklist indicating that all applicable technical and performance standards in appendix A to this part and the laboratory tests in the annex to appendix A to this part have been met.

(iv) *Verification of test results.*

Verification that a scale meets the laboratory evaluation and testing requirements in appendix A of this part and each of the influence quantity and disturbance tests as specified in the annex to appendix A to this part:

(A) Test results and data on forms supplied by NMFS;

(B) National Type Evaluation Program (NTEP) Certificates of Conformance, test results and data for a component of a scale or for the entire device. NTEP Certificates of Conformance, test results, and data may be submitted only in lieu of the specific influence factor tests conducted to obtain the NTEP Certificates of Conformance. Additional information must be submitted to verify compliance with the laboratory tests that are not performed under the NTEP; and/or

(C) International Organization of Legal Metrology (OIML) Certificates of Conformance, test results and data.

(2) *Inspection of at-sea scales—(i)*

What is an inspection? An inspection is a visual assessment and test of a scale after it is installed on the vessel and while the vessel is tied up at a dock and not under power at sea to determine if the scale meets all of the applicable performance and technical requirements in paragraph (b)(2) of this section and in appendix A to this part. A scale will be approved by the inspector if it meets all of the applicable performance and technical requirements in paragraph (b)(2) of this section and appendix A to this part.

(ii) *How often must a scale be inspected?* Each scale must be inspected and approved before the vessel may participate in any fishery requiring the weighing of catch at sea with an approved scale. Each scale must be reinspected within 12 months of the date of the most recent inspection.

(iii) *Who may perform scale inspections?* Scales must be inspected by a scale inspector authorized by NMFS. A list of scale inspectors authorized by NMFS is available from the Regional Administrator upon request. NMFS authorizes two types of scale inspectors:

(A) *Inspectors from an agency designated by NMFS.* Inspectors employed by a weights and measures agency designated by NMFS to perform scale inspections on behalf of NMFS. Scale inspections by such inspectors are paid for by NMFS.

(B) *Inspectors from other agencies.* Inspectors employed by a U.S., state, or local weights and measures agency other than the weights and measures agency designated by NMFS and meeting the following requirements:

(1) The inspector successfully completes training conducted by a scale inspector from the weights and measures agency designated by NMFS to perform scale inspections on behalf of NMFS. The training consists of observing a scale inspection conducted by a scale inspector designated by NMFS and conducting an inspection under the supervision of a scale inspector designated by NMFS. The inspector must obtain this training for each type of scale inspected.

(2) The inspector notifies NMFS in writing that he/she meets the requirements of this paragraph (b)(2)(iii)(B) prior to conducting any inspections.

(3) Inspectors from agencies other than the weights and measures agency designated by NMFS to perform scale inspections on behalf of NMFS must notify the Regional Administrator of the date, time, and location of the scale inspection at least 3 working days before the inspection is conducted so that NMFS staff may have the opportunity to observe the inspection.

(iv) *How does a vessel owner arrange for a scale inspection?* The time and place of the inspection may be arranged by contacting the authorized scale inspectors. Vessel owners must request a scale inspection at least 10 working days in advance of the requested inspection by contacting an authorized scale inspector at the address indicated on the list of authorized inspectors.

(v) *Where will scale inspections be conducted?* Scale inspections by inspectors paid by NMFS will be conducted on vessels tied up at docks in Dutch Harbor, Alaska, and in the Puget Sound area of Washington State.

(vi) *Responsibilities of the vessel owner during a scale inspection.* After the vessel owner has installed a model of scale that is on the Regional Administrator's list of scales eligible to be approved for weighing catch at sea, the vessel owner must:

(A) Make the vessel and scale available for inspection by a scale inspector authorized by the Regional Administrator.

(B) Provide a copy of the scale manual supplied by the scale manufacturer to the inspector at the beginning of the inspection.

(C) Transport test weights, test material, and equipment required to perform the test to and from the inspector's vehicle and the location on the vessel where the scale is installed.

(D) Apply test weights to the scale or convey test materials across the scale, if requested by the scale inspector.

(E) Assist the scale inspector in performing the scale inspection and testing.

(vii) *Scale inspection report.* A scale is approved for use when the scale inspector completes and signs a scale inspection report form verifying that the scale meets all of the requirements specified in this paragraph (b)(2) and appendix A to this part. Inspectors must use the scale inspection report form supplied by the weights and measures agency designated by NMFS to perform scale inspections on behalf of NMFS. The scale inspector must provide the original of this inspection report form to the vessel owner and a copy to NMFS. NMFS will maintain a list of all scales for which the inspection report form has been received and that are approved for use. The vessel owner is not required to submit the scale inspection report form to NMFS. However, the vessel owner must maintain a copy of the report form on board the vessel at all times when the processor or vessel is required to use a scale approved under this section. The scale inspection report form must be made available to the observer, NMFS personnel or an authorized officer, upon request. When in use, scales for which a scale inspection form has been completed and signed must also meet requirements described in paragraphs (b)(3) through (b)(6) of this section.

(3) *At-sea scale tests.* The vessel owner must ensure that the vessel operator tests each scale or scale system used to weigh total catch one time during each 24-hour period in which fish are weighed on the scale to verify that the scale meets the MPEs specified in this paragraph (b)(3).

(i) *Belt scales and automatic hopper scales.* (A) The MPE in the daily at-sea scale tests is plus or minus 3 percent of the known weight of the test material.

(B) *Test procedure.* A material test must be conducted by weighing at least 400 kg of fish or an alternative material supplied by the scale manufacturer on the scale under test. The known weight of the test material must be determined by weighing it on a platform scale approved for use under paragraph (b)(7) of this section.

(ii) *Platform and hanging scales—(A) Maximum Permissible Error.* The MPE for platform and hanging scales is plus or minus 0.5 percent of the known weight of the test material.

(B) *Test weights.* Each test weight must have its weight stamped on or otherwise permanently affixed to it. The weight of each test weight must be certified by a National Institute of Standards and Technology approved metrology laboratory. A copy of the laboratory certification documents must be maintained on board the vessel at all times while the scale is required. The amount of test weights that must be provided by the vessel owner is specified in paragraphs (b)(3)(ii)(B)(1) and (b)(3)(ii)(B)(2) of this section.

(1) *Platform scales used as observer sampling scales or to determine the known weight of test materials.* Any combination of test weights that will allow the scale to be tested at 10 kg, 25 kg, and 50 kg.

(2) *Scales used to weigh total catch.* Test weights equal to the largest amount of fish that will be weighed on the scale in one weighment.

(iii) *Requirements for all scale tests.*

(A) Notify the observer at least 15 minutes before the time that the test will be conducted, and conduct the test while the observer is present.

(B) Conduct the scale test by placing the test material or test weights on or across the scale and recording the following information on the at-sea scale test report form:

- (1) Vessel name;
- (2) Month, day, and year of test;
- (3) Time test started to the nearest minute;
- (4) Known weight of test material or test weights;
- (5) Weight of test material or test weights recorded by scale;
- (6) Percent error as determined by subtracting the known weight of the test material or test weights from the weight recorded on the scale, dividing that amount by the known weight of the test material or test weights, and multiplying by 100; and
- (7) Sea conditions at the time of the scale test.

(C) Maintain the test report form on board the vessel until the end of the fishing year during which the tests were conducted, and make the report forms available to observers, NMFS personnel, or an authorized officer. In addition, the scale test report forms must be retained by the vessel owner for 3 years after the end of the fishing year during which the tests were performed. All scale test report forms must be signed by the vessel operator.

(4) *Scale maintenance.* The vessel owner must ensure that the vessel operator maintains the scale in proper operating condition throughout its use; that adjustments made to the scale are made so as to bring the performance errors as close as practicable to a zero value; and that no adjustment is made that will cause the scale to weigh fish inaccurately.

(5) *Printed reports from the scale.* The vessel owner must ensure that the vessel operator provides the printed reports required by this paragraph. Printed reports from the scale must be maintained on board the vessel until the end of the year during which the reports were made and be made available to observers, NMFS personnel, or an authorized officer. In addition, printed reports must be retained by the vessel owner for 3 years after the end of the year during which the printouts were made. All printed reports from the scale must be signed by the vessel operator.

(i) *Reports of catch weight and cumulative weight.* Reports must be printed at least once each 24-hour period in which the scale is being used to weigh catch or before any information stored in the scale computer memory is replaced. The haul or set number recorded on the scale print-out must correspond with haul or set numbers recorded in the processor's daily cumulative production logbook. Scale weights must not be adjusted by the scale operator to account for the perceived weight of water, mud, debris, or other materials. The information that must be printed is described in Sections 2.3.1.8, 3.3.1.7, and 4.3.1.5 of appendix A to this part.

(ii) *Printed report from the audit trail.* The printed report must include the information specified in sections 2.3.1.8, 3.3.1.7, and 4.3.1.8 of appendix A to this part. The printed report must be provided to the authorized scale inspector at each scale inspection and must also be printed at any time upon request of the observer, the scale inspector, NMFS staff, or an authorized officer.

(6) *Scale installation requirements.* The observer must be able to see the product on the scale and the scale indications at the same time.

(7) *Platform scales used as observer sampling scales or to determine the known weight of test materials.* Platform scales used only as observer sampling scales or to determine the known weight of fish for a material test of another scale are required to meet all of the requirements of paragraph (b) of this section and appendix A to this part except sections 4.3.1 and 4.3.1.5 of appendix A to this part (printer) or

section 4.3.1.8 (audit trail) of appendix A to this part.

3. Appendix A to part 679 is added immediately following subpart F of part 679, before the figures and tables, to read as follows:

**Appendix A to Subpart F of Part 679—
Performance and Technical
Requirements for Scales Used To Weigh
Catch at Sea in the Groundfish
Fisheries Off Alaska**

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A.4 Bibliography

1. Introduction

(a) This appendix to part 679 contains the performance and technical requirements for scales to be approved by NMFS for use to weigh, at sea, catch from the groundfish fisheries off Alaska. The performance and technical requirements in this document have not been reviewed or endorsed by the National Conference on Weights and Measures. Regulations implementing the requirements of this appendix and additional requirements for and with respect to scales used to weigh catch at sea are found at 50 CFR 679.28(b).

(b) Revisions, amendments, or additions to this appendix may be made after notice and opportunity for public comments. Send requests for revisions, amendments, or additions to the Sustainable Fisheries Division, Alaska Region, NMFS, P.O. Box 21668, Juneau, AK 99802.

(c) *Types of Scales Covered by Appendix*—This appendix contains performance and technical requirements for belt, automatic hopper, platform, and hanging scales.

(d) *Testing and Approval of Scales Used to Weigh Catch at Sea*—Scales used to weigh catch at sea are required to comply with four categories of performance and technical requirements: (1) Type evaluation; (2) initial inspection after installation while the vessel is tied up at a dock and is not under power at sea; (3) annual reinspection while the vessel is tied up at a dock and is not under power at sea; and (4) daily at-sea tests of the scale's accuracy. This appendix contains only the performance and technical requirements for type evaluation and initial and annual reinspections by an authorized scale inspector.

2. Belt Scales

2.1 *Applicability*. The requirements in this section apply to a scale or scale system that employs a conveyor belt in contact with a weighing element to determine the weight of a bulk commodity being conveyed across the scale.

2.2 *Performance Requirements*—2.2.1 *Maximum Permissible Errors*. For laboratory tests of a scale and initial inspections and annual reinspections of an installed scale when the vessel is tied up at a dock and is not under power at sea, the following maximum permissible errors (MPEs) are specified:

2.2.1.1 *Laboratory Tests*. See annex A to this appendix A for procedures for disturbance tests and influence factors.

a. *Disturbances*. ± 0.18 percent of the weight of the load totalized.

b. *Influence Factors*. ± 0.25 percent of the weight of the load totalized.

c. *Temperature Effect at Zero Flow Rate*. The difference between the values obtained at zero flow rate taken at temperatures that differ by $10^{\circ}\text{C} \pm 0.2^{\circ}\text{C}$ must not be greater than 0.035 percent of the weight of the load totalized at the maximum flow-rate for the time of the test.

2.2.1.2 *Zero Load Tests*. For zero load tests conducted in a laboratory or on a scale installed on a vessel and conducted when the vessel is tied up at a dock and not under power at sea, ± 0.1 percent of the value of the minimum totalized load or 1 scale division (d), whichever is greater.

2.2.1.3 *Material Tests*. For material tests conducted in a laboratory or on a scale installed on a vessel and conducted when the vessel is tied up at a dock and not under power at sea, ± 1.0 percent of the known weight of the test material.

2.2.2 *Minimum Flow Rate (Q_{min})*. The minimum flow rate must be specified by the manufacturer and must not be greater than 35 percent of the rated capacity of the scale in kilograms per hour (kg/hr) or metric tons per hour (mt/hr).

2.2.3 *Minimum Totalized Load (Σ_{min})*. The minimum totalized load must not be less than the greater of—

- a. Two percent of the load totalized in 1 hour at the maximum flow rate;
- b. The load obtained at the maximum flow rate in 1 revolution of the belt; or
- c. A load equal to 800 scale divisions (d).

2.2.4 *Influence Quantities*. The following requirements apply to influence factor tests conducted in the laboratory.

2.2.4.1 *Temperature*. A belt scale must comply with the performance and technical requirements at a range of temperatures from -10°C to $+40^{\circ}\text{C}$. However, for special applications the temperature range may be different, but the range must not be less than 30°C and must be so specified on the scale's descriptive markings.

2.2.4.2 *Power Supply*. A belt scale must comply with the performance and technical requirements when operated within a range of -15 percent to $+10$ percent of the power supply specified on the scale's descriptive markings.

2.3.1 *Technical Requirements*.

2.3.1 *Indicators and Printers*.

2.3.1.1 *General*. A belt scale must be equipped with an indicator capable of displaying both the weight of fish in each haul or set and the cumulative weight of all fish or other material weighed on the scale between annual inspections ("the cumulative weight"), a rate of flow indicator, and a printer. The indications and printed representations must be clear, definite, accurate, and easily read under all conditions of normal operation of the belt scale.

2.3.1.2 *Values Defined*. If indications or printed representations are intended to have specific values, these must be defined by a sufficient number of figures, words, or symbols, uniformly placed with reference to the indications or printed representations and as close as practicable to the indications or printed representations but not so

positioned as to interfere with the accuracy of reading.

2.3.1.3 *Units*. The weight of each haul or set must be indicated in kilograms, and the cumulative weight must be indicated in either kilograms or metric tons and decimal subdivisions.

2.3.1.4 *Value of the Scale Division*. The value of the scale division (d) expressed in a unit of weight must be equal to 1, 2, or 5, or a decimal multiple or sub-multiple of 1, 2, or 5.

2.3.1.5 *Range of Indication*. The range of the weight indications and printed values for each haul or set must be from 0 kg to 999,999 kg and for the cumulative weight must be from 0 to 99,999 metric tons.

2.3.1.6 *Resettable and Non-resettable Values*. The means to indicate the weight of fish in each haul or set must be resettable to zero. The means to indicate the cumulative weight must not be resettable to zero without breaking a security means and must be reset only upon direction of NMFS or an authorized scale inspector.

2.3.1.7 *Rate of Flow Indicator*. Permanent means must be provided to produce an audio or visual signal when the rate of flow is less than the minimum flow rate or greater than 98 percent of the maximum flow rate.

2.3.1.8 *Printed Information*. The information printed must include—

- a. For catch weight:
 - i. The vessel name;
 - ii. The Federal fisheries or processor permit number of the vessel;
 - iii. The haul or set number;
 - iv. The month, day, year, and time (to the nearest minute) weighing catch from the haul or set started;
 - v. The month, day, year, and time (to the nearest minute) weighing catch from the haul or set ended;
 - vi. The total weight of catch in each haul or set;
 - vii. The total cumulative weight of all fish or other material weighed on the scale; and
 - viii. The date and time the information is printed.
- b. For the audit trail:
 - i. The vessel name;
 - ii. The Federal fisheries or processor permit number of the vessel;
 - iii. The date and time (to the nearest minute) that the adjustment was made;
 - iv. The name or type of adjustment being made; and
 - v. The initial and final values of the parameter being changed.

2.3.1.9 *Permanence of Markings*. All required indications, markings, and instructions must be distinct and easily readable and must be of such character that they will not tend to become obliterated or illegible.

2.3.1.10 *Power Loss*. In the event of a power failure, means must be provided to retain in a memory the weight of fish in each haul or set for which a printed record has not yet been made, the cumulative weight, and the information on the audit trail.

2.3.1.11 *Adjustable Components*. An adjustable component that when adjusted

affects the performance or accuracy of the scale must be held securely in position and must not be capable of adjustment without breaking a security means unless a record of the adjustment is made on the audit trail described in 2.3.1.12.

2.3.1.12 *Audit Trail.* An audit trail in the form of an event logger must be provided to document changes made using adjustable components. The following information must be provided in an electronic form that cannot be changed or erased by the scale operator, can be printed at any time, and can be cleared by the scale manufacturer's representative upon direction by NMFS or by an authorized scale inspector:

- a. The date and time (to the nearest minute) of the change;
- b. The name or type of adjustment being made; and
- c. The initial and final values of the parameter being changed.

2.3.1.13 *Adjustments to Scale Weights.* The indicators and printer must be designed so that the scale operator cannot change or adjust the indicated and printed weight values.

2.3.2 *Weighing Elements.*

2.3.2.1 *Speed Measurement.* A belt scale must be equipped with means to accurately sense the belt travel and/or speed whether the belt is loaded or empty.

2.3.2.2 *Conveyer Belt.* The weight per unit length of the conveyer belt must be practically constant. Belt joints must be such that there are no significant effects on the weighing results.

2.3.2.3 *Overload Protection.* The load receiver must be equipped with means so that an overload of 150 percent or more of the capacity does not affect the metrological characteristics of the scale.

2.3.2.4 *Speed Control.* The speed of the belt must not vary by more than 5 percent of the nominal speed.

2.3.2.5 *Adjustable Components.* An adjustable component that can affect the performance of the belt scale must be held securely in position and must not be capable of adjustment without breaking a security means.

2.3.2.6 *Motion Compensation.* A belt scale must be equipped with automatic means to compensate for the motion of a vessel at sea so that the weight values indicated are within the MPEs. Such means shall be a reference load cell and a reference mass weight or other equally effective means. When equivalent means are utilized, the manufacturer must provide NMFS with information demonstrating that the scale can weigh accurately at sea.

2.3.3 *Installation Conditions.* A belt scale must be rigidly installed in a level condition.

2.3.4 *Marking.* A belt scale must be marked with the—

- a. Name, initials, or trademark of the manufacturer or distributor;
- b. Model designation;
- c. Non-repetitive serial number;
- d. Maximum flow rate (Q_{max});
- e. Minimum flow rate (Q_{min});
- f. Minimum totalized load (Σ_{min});
- g. Value of a scale division (d);
- h. Belt speed;
- i. Weigh length;

j. Maximum capacity (Max);

k. Temperature range (if applicable); and

l. Mains voltage.
2.3.4.1 *Presentation.* The markings must be reasonably permanent and of such size, shape, and clarity to provide easy reading in normal conditions of use. They must be grouped together in a place visible to the operator.

2.4 *Tests.*

2.4.1 *Minimum Test Load.* The minimum test load must be the greater of—

- a. 2 percent of the load totalized in 1 hour at the maximum flow rate;
- b. The load obtained at maximum flow rate in one revolution of the belt; or
- c. A load equal to 800 scale divisions.

2.4.2 *Laboratory Tests.*

2.4.2.1 *Influence Quantity and Disturbance Tests.* Tests must be conducted according to annex A and the results of these tests must be within the values specified in section 2.2.1.1.

2.4.2.2 *Zero-Load Tests.* A zero-load test must be conducted for a time equal to that required to deliver the minimum totalized load ("min"). At least two zero-load tests must be conducted prior to a material test. The results of these tests must be within the values specified in section 2.2.1.2.

2.4.2.3 *Material Tests.* At least one material test must be conducted with the weight of the material or simulated material equal to or greater than the minimum test load. The results of these tests must be within the values specified in section 2.2.1.3.

2.4.3 *Annual Inspections.*

2.4.3.1 *Zero-Load Tests.* A zero-load test must be conducted for a time equal to that required to deliver the minimum totalized load (Σ_{min}). At least one zero-load test must be conducted prior to each material test. The results of this test must be within the values specified in section 2.2.1.2.

2.4.3.2 *Material Tests.* At least one material or simulated material test must be conducted with the weight of the material or simulated material equal to or greater than the minimum test load. The results of these tests must be within the values specified in section 2.2.1.3.

3. *Automatic Hopper Scales*

3.1 *Applicability.* The requirements in this section apply to a scale or scale system that is designed for automatic weighing of a bulk commodity in predetermined amounts.

3.2 *Performance Requirements.*

3.2.1 *Maximum Permissible Errors.* For laboratory tests of a scale and initial inspection and annual reinspections of an installed scale when the vessel is tied up at a dock and is not under power at sea, the following MPEs are specified:

3.2.1.1 *Laboratory Tests.* See annex A to appendix A for procedures for disturbance test and influence factors.

a. *Disturbances.* Significant fault (sf) (\pm scale division).

b. *Influence Factors.* ± 1 percent of test load.

3.2.1.2 *Increasing and Decreasing Load Tests.* For increasing and decreasing load tests conducted in a laboratory or on a scale installed on a vessel tied up at a dock and not under power at sea, ± 1.0 percent of the test load.

3.2.2 *Minimum Weightment (Σ_{min}).* The minimum weightment must not be less than 20 percent of the weighing capacity, or a load equal to 100 scale intervals (d), except for the final weightment of a lot.

3.2.3 *Minimum Totalized Load (Lot).* The minimum totalized load must not be less than 4 weightments.

3.2.4 *Influence Quantities.* The following requirements apply to influence factor tests conducted in the laboratory:

3.2.4.1 *Temperature.* A hopper scale must comply with the metrological and technical requirements at temperatures from -10° C to $+40^{\circ}$ C. However, for special applications the temperature range may be different, but the range must not be less than 30° C and must be so specified on the scale's descriptive markings.

3.2.4.1.1 *Operating Temperature.* A hopper scale must not display or print any usable weight values until the operating temperature necessary for accurate weighing and a stable zero-balance condition have been attained.

3.2.4.2 *Power Supply.* A hopper scale must comply with the performance and technical requirements when operated within -15 percent to $+10$ percent of the power supply specified on the scale's descriptive markings.

3.3 *Technical Requirements.*

3.3.1 *Indicators and Printers.*

3.3.1.1 *General.* a. A hopper scale must be equipped with an indicator and printer that indicates and prints the weight of each load and a no-load reference value; and a printer that prints the total weight of fish in each haul or set and the total cumulative weight of all fish and other material weighed on the scale between annual inspections ("the cumulative weight"). The indications and printed information must be clear, definite, accurate, and easily read under all conditions of normal operation of the hopper scale.

b. A no-load reference value may be a positive or negative value in terms of scale divisions or zero. When the no-load reference value is zero, the scale must return to a zero indication (within ± 0.5 scale division) when the load receptor (hopper) is empty following the discharge of all loads, without the intervention of either automatic or manual means.

3.3.1.2 *Values Defined.* If indications or printed representations are intended to have specific values, these must be defined by a sufficient number of figures, words, or symbols, uniformly placed with reference to the indications or printed representations and as close as practicable to the indications or printed representations but not so positioned as to interfere with the accuracy of reading.

3.3.1.3 *Units.* The weight of each haul or set must be indicated in kilograms, and the cumulative weight must be indicated in either kilograms or metric tons and decimal subdivisions.

3.3.1.4 *Value of the Scale Division.* The value of the scale division (d) expressed in a unit of weight must be equal to 1, 2, or 5, or a decimal multiple or sub-multiple of 1, 2, or 5.

3.3.1.5 *Weighing Sequence.* For hopper scales used to receive (weigh in), the no-load

reference value must be determined and printed only at the beginning of each weighing cycle. For hopper scales used to deliver (weigh out), the no-load reference value must be determined and printed only after the gross-load weight value for each weighing cycle has been indicated and printed.

3.3.1.6 Printing Sequence. Provision must be made so that all weight values are indicated until the completion of the printing of the indicated values.

3.3.1.7 Printed Information. The information printed must include—

- a. For catch weight:
 - i. The vessel name;
 - ii. The Federal fisheries or processor permit number of the vessel;
 - iii. The haul or set number;
 - iv. The month, day, year, and time (to the nearest minute) weighing catch from the haul or set started;
 - v. The month, day, year, and time (to the nearest minute) weighing catch from the haul or set ended;
 - vi. The total weight of catch in each haul or set;
 - vii. The total cumulative weight of all fish or other material weighed on the scale; and
 - viii. The date and time the information is printed.
- b. For the audit trail:
 - i. The vessel name;
 - ii. The Federal fisheries or processor permit number of the vessel;
 - iii. The date and time (to the nearest minute) of the change;
 - iv. The name or type of adjustment being made; and
 - v. The initial and final values of the parameter being changed.

3.3.1.8 Permanence of Markings. All required indications, markings, and instructions must be distinct and easily readable and must be of such character that they will not tend to become obliterated or illegible.

3.3.1.9 Range of Indication. The range of the weight indications and printed values for each haul or set must be from 0 kg to 999,999 kg and for the cumulative weight must be from 0 to 99,999 metric tons.

3.3.1.10 Non-Resettable Values. The cumulative weight must not be resettable to zero without breaking a security means and must be reset only upon direction by NMFS or by an authorized scale inspector.

3.3.1.11 Power Loss. In the event of a power failure, means must be provided to retain in a memory the weight of fish in each haul or set for which a printed record has not yet been made, the cumulative weight, and the information on the audit trail described in 3.3.1.13.

3.3.1.12 Adjustable Components. An adjustable component that, when adjusted, affects the performance or accuracy of the scale must not be capable of adjustment without breaking a security means, unless a record of the adjustment is made on the audit trail described in 3.3.1.13.

3.3.1.13 Audit Trail. An audit trail in the form of an event logger must be provided to document changes made using adjustable components. The following information must be provided in an electronic form that cannot

be changed or erased by the scale operator, can be printed at any time, and can be cleared by the scale manufacturer's representative upon direction of NMFS or by an authorized scale inspector:

- a. The date and time (to the nearest minute) of the change;
 - b. The name or type of adjustment being made; and
 - c. The initial and final values of the parameter being changed.
- 3.3.1.14 Zero-Load Adjustment.** A hopper scale must be equipped with a manual or semi-automatic means that can be used to adjust the zero-load balance or no-load reference value.

3.3.1.14.1 Manual. A manual means must be operable or accessible only by a tool outside of, or entirely separate from, this mechanism or enclosed in a cabinet.

3.3.1.14.2 Semi-Automatic. A semi-automatic means must be operable only when the indication is stable within ± 1 scale division and cannot be operated during a weighing cycle (operation).

3.3.1.15 Damping Means. A hopper scale must be equipped with effective automatic means to bring the indications quickly to a readable stable equilibrium. Effective automatic means must also be provided to permit the recording of weight values only when the indication is stable within plus or minus one scale division.

3.3.1.16 Adjustments to Scale Weights. The indicators and printer must be designed so that the scale operator cannot change or adjust the indicated and printed weight values.

3.3.2 Interlocks and Gate Control. A hopper scale must have operating interlocks so that—

- a. Product cannot be weighed if the printer is disconnected or subject to a power loss;
- b. The printer cannot print a weight if either of the gates leading to or from the weigh hopper is open;
- c. The low paper sensor of the printer is activated;
- d. The system will operate only in the sequence intended; and
- e. If the overflow sensor is activated, this condition is indicated to the operator and is printed.

3.3.3 Overflow Sensor. The weigh hopper must be equipped with an overflow sensor that will cause the feed gate to close, activate an alarm, and stop the weighing operation until the overflow condition has been corrected.

3.3.4 Weighing Elements.

3.3.4.1 Overload Protection. The weigh hopper must be equipped with means so that an overload of 150 percent or more of the capacity of the hopper does not affect the metrological characteristics of the scale.

3.3.4.2 Adjustable Components. An adjustable component that can affect the performance of the hopper scale must be held securely in position and must not be capable of adjustment without breaking a security means.

3.3.4.3 Motion Compensation. A hopper scale must be equipped with automatic means to compensate for the motion of a vessel at sea so that the weight values indicated are within the MPEs. Such means shall be a reference load cell and a reference

mass weight or other equally effective means. When equivalent means are utilized, the manufacturer must provide NMFS with information demonstrating that the scale can weigh accurately at sea.

3.3.5 Installation Conditions. A hopper scale must be rigidly installed in a level condition.

3.3.6 Marking. A hopper scale must be marked with the following:

- a. Name, initials, or trademark of the manufacturer or distributor;
- b. Model designation;
- c. Non-repetitive serial number;
- d. Maximum capacity (Max);
- e. Minimum capacity (min);
- f. Minimum totalized load (Σ min);
- g. Minimum weightment;
- h. Value of the scale division (d);
- i. Temperature range (if applicable); and
- j. Mains voltage.

3.3.6.1 Presentation. Descriptive markings must be reasonably permanent and grouped together in a place visible to the operator.

3.4 Tests.

3.4.1 Standards. The error of the standards used must not exceed 25 percent of the MPE to be applied.

3.4.2 Laboratory Tests.

3.4.2.1 Influence Quantity and Disturbance Tests. Tests must be conducted according to annex A and the results of these tests must be within the values specified in section 3.2.1.1.

3.4.2.2 Performance Tests. Performance tests must be conducted as follows:

a. **Increasing load test.** At least five increasing load tests must be conducted with test loads at the minimum load, at a load near capacity, and at 2 or more critical points in between; and

b. **Decreasing load test.** A decreasing load test must be conducted with a test load approximately equal to one-half capacity when removing the test loads of an increasing load test.

3.4.3 Annual Inspections.

At least two increasing load tests and two decreasing load tests must be conducted as specified in 3.4.2.2. Additionally, tests must be conducted with test loads approximately equal to the weight of loads at which the scale is normally used.

4. Platform Scales and Hanging Scales -

4.1 Applicability. The requirements in this section apply to platform and hanging scales used to weigh total catch. Platform scales used only as observer sampling scales or to determine the known weight of fish for a material test of another scale are not required to have a printer under sections 4.3.1 and 4.3.1.5 or an audit trail under section 4.3.1.8.

4.2 Performance Requirements.

4.2.1 Maximum Permissible Errors. For laboratory tests of a scale and initial inspection and annual reinspections of an installed scale while the vessel is tied up at a dock and is not under power at sea, the following MPEs are specified:

4.2.1.1 Laboratory Tests. See annex A to this appendix A for procedures for disturbance tests and influence factors.

a. *Disturbances.* Significant fault (± 1 scale division); and

b. *Influence Factors.* See Table 1 in section 4.2.1.2.

4.2.1.2 *Increasing and Decreasing Load and Shift Tests.* Increasing and decreasing load and shift tests conducted in a laboratory or on a scale installed on a vessel while the vessel is tied up at a dock and is not under power at sea, see Table 1 as follows:

TABLE 1.—INFLUENCE FACTORS

Test load in scale divisions (d)		Maximum permissible error (d)
Class III ¹	Class IIII	
0 < m ² ≤ 500	0 < m ≤ 50 ...	0.5
500 < m ≤ 2000 ..	50 < m ≤ 200	1.0
2000 < m	200 < m	1.5

¹ Scale accuracy classes are defined in section 4.2.2, table 2.

² Mass or weight of the test load in scale divisions.

4.2.2 *Accuracy Classes.* Scales are divided into two accuracy classes, class III and class IIII. The accuracy class of a scale is designated by the manufacturer. The design of each accuracy class with respect to number of scale divisions (n) and the value of the scale division (d) is specified according to table 2:

TABLE 2.—ACCURACY CLASSES

Accuracy class	Value of scale division (d)	Number of scale divisions (n)	
		Minimum	Maximum
III	5 g or greater	500	10,000
IIII	5 g or greater	100	1,000

4.2.3 *Minimum Load:* For a Class III scale, 20d; for a Class IIII scale, 10d.

4.2.4 *Influence Quantities.* The following requirements apply to influence factor tests conducted in the laboratory.

4.2.4.1 *Temperature.* A scale must comply with the performance and technical requirements at temperatures from -10° C to $+40^{\circ}$ C. However, for special applications the temperature range may be different, but the range must not be less than 30° C and must be so specified on the descriptive markings.

4.2.4.1.1 *Operating Temperature.* A scale must not display or print any usable weight values until the operating temperature necessary for accurate weighing and a stable zero-balance condition have been attained.

4.2.4.2 *Power Supply.* A scale must comply with the performance and technical requirements when operated within -15 percent to $+10$ percent of the power supply specified on the scale's descriptive markings.

4.3 *Technical Requirements.*

4.3.1 *Indicators and Printers.*

4.3.1.1 *General.* A scale must be equipped with an indicator and a printer. The indications and printed information must be clear, definite, accurate, and easily read under all conditions of normal operation of the scale.

4.3.1.2 *Values Defined.* If indications or printed representations are intended to have specific values, these must be defined by a sufficient number of figures, words, or symbols, uniformly placed with reference to the indications or printed representations and as close as practicable to the indications or printed representations but not so positioned as to interfere with the accuracy of reading.

4.3.1.3 *Units.* The weight units indicated must be in terms of kilograms and decimal subdivisions.

4.3.1.4 *Value of the Scale Division.* The value of the scale division (d) expressed in a unit of weight must be equal to 1, 2, or 5, or a decimal multiple or sub-multiple of 1, 2, or 5.

4.3.1.5 *Printed Information.* The information printed must include—

- a. For catch weight:
 - i. The vessel name;
 - ii. The Federal fisheries or processor permit number of the vessel;
 - iii. The haul or set number;
 - iv. The month, day, year, and time (to the nearest minute) of weighing; and
 - v. Net weight of the fish.
- b. For the audit trail:
 - i. The vessel name;
 - ii. The Federal fisheries or processor permit number of the vessel;
 - iii. The date and time (to the nearest minute) of the change;
 - iv. The name or type of adjustment being made; and
 - v. The initial and final values of the parameter being changed.

4.3.1.6 *Permanence of Markings.* All required indications, markings, and instructions must be distinct and easily readable and must be of such character that they will not tend to become obliterated or illegible.

4.3.1.7 *Power Loss.* In the event of a power failure, means must be provided to retain in a memory the weight of the last weightment if it is a non-repeatable weightment.

4.3.1.8 *Adjustable Components.*

a. An adjustable component that, when adjusted, affects the performance or accuracy of the scale must be held securely in position and must not be capable of adjustment without breaking a security means.

b. An audit trail in the form of an event logger must be provided to document changes made using adjustable components. The following information must be provided in an electronic form that cannot be changed or erased by the scale operator, can be printed at any time, and can be cleared by the scale manufacturer's representative upon direction of NMFS or an authorized scale inspector:

- i. The date and time (to the nearest minute) of the change;
- ii. The name or type of adjustment being made; and
- iii. The initial and final values of the parameter being changed.

4.3.1.9 *Zero-Load Adjustment.* A scale must be equipped with a manual or semi-automatic means that can be used to adjust the zero-load balance or no-load reference value.

4.3.1.9.1 *Manual.* A manual means must be operable or accessible only by a tool outside of or entirely separate from this mechanism or enclosed in a cabinet.

4.3.1.9.2 *Semi-automatic.* A semi-automatic means must meet the provisions of 4.3.1.8 or must be operable only when the indication is stable within ± 1 scale division and cannot be operated during a weighing cycle (operation).

4.3.1.10 *Damping Means.* A scale must be equipped with effective automatic means to bring the indications quickly to a readable stable equilibrium. Effective automatic means must also be provided to permit the recording of weight values only when the indication is stable within plus or minus one scale division.

4.3.2 *Weighing Elements.*

4.3.2.1 *Overload Protection.* The scale must be so designed that an overload of 150 percent or more of the capacity does not affect the metrological characteristics of the scale.

4.3.2.2 *Adjustable Components.* An adjustable component that can affect the performance of the scale must be held securely in position and must not be capable of adjustment without breaking a security means.

4.3.2.3 *Motion Compensation.* A platform scale must be equipped with automatic means to compensate for the motion of a vessel at sea so that the weight values indicated are within the MPEs. Such means shall be a reference load cell and a reference mass weight or other equally effective means. When equivalent means are utilized, the manufacturer must provide NMFS with information demonstrating that the scale can weigh accurately at sea.

4.3.3 *Installation Conditions.* A platform scale must be rigidly installed in a level condition. When in use, a hanging scale must be freely suspended from a fixed support or a crane.

4.3.4 *Marking.* A scale must be marked with the following:

- a. Name, initials, or trademark of the manufacturer or distributor;
- b. Model designation;
- c. Non-repetitive serial number;
- d. Accuracy class (III or IIII);
- e. Maximum capacity (Max);
- f. Minimum capacity (min);
- g. Value of a scale division (d);
- h. Temperature range (if applicable); and
- i. Mains voltage.

4.3.4.1 *Presentation.* Descriptive markings must be reasonably permanent and grouped together in a place visible to the operator.

4.4 *Tests.*

4.4.1 *Standards.* The error of the standards used must not exceed 25 percent of the MPE applied.

4.4.2 *Laboratory Tests.*

4.4.2.1 *Influence Quantities and Disturbance Tests.* Tests must be conducted according to annex A to this appendix A, and the results of these tests must be within the values specified in section 4.2.1.1.

4.4.2.2 *Performance Tests.* Performance tests must be conducted as follows:

- a. *Increasing load test.* At least five increasing load tests must be conducted with

test loads at the minimum load, at a load near capacity, and at 2 or more critical points in between.

b. *Shift test (platform scales only)*. A shift test must be conducted during the increasing load test at one-third capacity test load centered in each quadrant of the platform.

c. *Decreasing load test*. A decreasing load test must be conducted with a test load approximately equal to one-half capacity when removing the test loads of an increasing load test.

4.4.3 Annual Scale Inspections.

At least two increasing load tests, shift tests, and decreasing load tests must be conducted as specified in section 4.4.2.2. Additionally tests must be conducted with test loads approximately equal to the weight of loads at which the scale is normally used. The results of all tests must be as specified in Table 1 in section 4.2.1.2.

5. Definitions

Adjustable component—Any component that, when adjusted, affects the performance or accuracy of the scale, e.g., span adjustment or automatic zero-setting means. Manual or semi-automatic zero-setting means are not considered adjustable components.

Audit trail—An electronic count and/or information record of the changes to the values of the calibration or configuration parameters of a scale.

Automatic hopper scale—A hopper scale adapted to the automatic weighing of a bulk commodity (fish) in predetermined amounts. Capacities vary from 20 kg to 50 mt. It is generally equipped with a control panel, with functions to be set by an operator, including the start of an automatic operation. (See definition of hopper scale).

Belt scale—A scale that employs a conveyor belt in contact with a weighing element to determine the weight of a bulk commodity being conveyed. It is generally a part of a system consisting of an input conveyor, the flow scale, and an output conveyor. The conveyor belt may be constructed of various materials, including vulcanized rubber, canvas, and plastic. The capacity is generally specified in terms of the amount of weight that can be determined in a specified time, and can vary from, for example, 1 ton per hour to 100 or more tons per hour. An operator generally directs the flow of product onto the input conveyor.

Calibration mode—A means by which the span of a scale can be adjusted by placing a known "test weight" on the scale and manually operating a key on a key board.

Disturbances—An influence that may occur during the use of a scale but is not within the rated operating conditions of the scale.

Event logger—A form of audit trail containing a series of records where each record contains the identification of the parameter that was changed, the time and date when the parameter was changed, and the new value of the parameter.

Final weighing—The last partial load, weighed on a hopper scale that is part of the weight of many loads.

Hanging scale—A scale that is designed to weigh a load that is freely suspended from an overhead crane or it may be permanently

installed in an overhead position. The load receiver may be a part of the scale such as a pan suspended on chains, or simply a hook that is used to "pick-up" the container of the commodity to be weighed. The technology employed may be mechanical, electro-mechanical, or electronic. The loads can be applied either manually or by such means as a crane.

Hopper scale—A scale designed for weighing individual loads of a bulk commodity (fish). The load receiver is a cylindrical or rectangular container mounted on a weighing element. The weighing element may be mechanical levers, a combination of levers and a load cell, or all load cells. The capacity can vary from less than 20 kg to greater than 50 mt. The loads are applied from a bulk source by such means as a conveyor or storage hopper. Each step of the weighing process, that is the loading and unloading of the weigh hopper, is controlled by an operator.

Indicator—That part of a scale that indicates the quantity that is being weighed.

Influence factor—A value of an influence quantity, e.g., 10°, that specifies the limits of the rated operating conditions of the scale.

Influence quantity—A quantity that is not the subject of the measurement but which influences the measurement obtained within the rated operating conditions of the scale.

Influence quantity and disturbance tests—Tests conducted in a laboratory to determine the capability of the scale under test to perform correctly in the environmental influences in which they are used and when subjected to certain disturbances that may occur during the use of the scale.

Initial verification—The first evaluation (inspection and test) of a production model of a weighing instrument that has been type evaluated to determine that the production model is consistent with the model that had been submitted for type evaluation.

Known weight test—A test in which the load applied is a test weight with a known value simulating the weight of the material that is usually weighed.

Load receiver—That part of the scale in which the quantity is placed when being weighed.

Material test—A test using a material that is the same or similar to the material that is usually weighed, the weight of which has been determined by a scale other than the scale under test.

Maximum flow-rate—The maximum flow-rate of material specified by the manufacturer at which a belt scale can perform correctly.

Minimum flow-rate—The minimum flow-rate specified by the manufacturer at which a belt scale can perform correctly.

Minimum load—The smallest weight load that can be determined by the scale that is considered to be metrologically acceptable.

Minimum totalized load—The smallest weight load that can be determined by a belt scale that is considered to be metrologically acceptable.

Minimum weighing—The smallest weight that can be determined by a hopper scale that is considered to be metrologically acceptable.

Motion compensation—The means used to compensate for the motion of the vessel at sea.

No-load reference value—A weight value obtained by a hopper scale when the load receiver (hopper) is empty of the product that was or is to be weighed.

Non-repeatable weighing—A process where the product after being weighed is disposed of in such a manner that it cannot be retrieved to be reweighed.

Number of scale divisions (n)—The number of scale divisions of a scale in normal operation. It is the quotient of the scale capacity divided by the value of the scale division. $n = \text{Max}/d$

Performance requirements—A part of the regulations or standards that applies to the weighing performance of a scale, e.g., MPEs.

Performance test—A test conducted to determine that the scale is performing within the MPE applicable.

Periodic verification—A verification of a weighing instrument at an interval that is specified by regulation or administrative ruling.

Platform scale—A scale by the nature of its physical size, arrangement of parts, and relatively small capacity (generally 220 kg or less) that is adapted for use on a bench or counter or on the floor. A platform scale can be self contained, that is, the indicator and load receiver and weighing elements are all comprised of a single unit, or the indicator can be connected by cable to a separate load receiver and weighing element. The technology used may be mechanical, electro-mechanical, or electronic. Loads are applied manually.

Rated capacity—The maximum flow-rate in terms of weight per unit time specified by the manufacturer at which a belt scale can perform correctly.

Scale division (d)—The smallest digital subdivision in units of mass that is indicated by the weighing instrument in normal operation.

Sealing—A method used to prevent the adjustment of certain operational characteristics or to indicate that adjustments have been made to those operational characteristics.

Security seals or means—A physical seal such as a lead and wire seal that must be broken in order to change the operating or performance characteristics of the scale.

Significant fault—An error greater than the value specified for a particular scale. For a belt scale: A fault greater than 0.18 percent of the weight value equal to the minimum totalized load. For all other scales: 1 scale division (d). A significant fault does not include faults that result from simultaneous and mutually independent causes in the belt scale; faults that imply the impossibility of performing any measurement; transitory faults that are momentary variations in the indications that cannot be interpreted, memorized, or transmitted as a measurement result; faults so serious that they will inevitably be noticed by those interested in the measurement.

Simulated material test—A test in which the load applied is test material simulating the weight of the material that is usually weighed.

Simulated test—A test in which the weight indications are developed by means other than weight, e.g., a load cell simulator.

Stationary installation—An installation of a scale in a facility on land or a vessel that is tied-up to a dock or in dry dock.

Subsequent verification—Any evaluation of a weighing instrument following the initial verification.

Suitability for use—A judgement that must be made that certain scales by nature of their design are appropriate for given weighing applications.

Technical requirements—A part of the regulations or standards that applies to the operational functions and characteristics of a scale, e.g., capacity, scale division, tare.

Testing laboratory—A facility for conducting type evaluation examinations of a scale that can establish its competency and proficiency by such means as ISO Guide 25, ISO 9000, EN 45011, NVLAP, NTEP.

Type evaluation—A process for evaluating the compliance of a weighing instrument with the appropriate standard or regulation.

User requirements—A part of the regulations or standards that applies to the operator/owner of the scale.

Weighment—A single complete weighing operation.

Annex A to Appendix A to Part 679—Influence Quantity and Disturbance Tests

A.1 General—Included in this annex are tests that are intended to ensure that electronic scales can perform and function as intended in the environment and under the conditions specified. Each test indicates, where appropriate, the reference condition under which the intrinsic error is determined.

A.2 Test Considerations

A.2.1 All electronic scales of the same category must be subjected to the same performance test program.

A.2.2 Tests must be carried out on fully operational equipment in its normal operational state. When equipment is connected in other than a normal configuration, the procedure must be mutually agreed to by NMFS and the applicant.

A.2.3 When the effect of one factor is being evaluated, all other factors must be held relatively constant, at a value close to normal. The temperature is deemed to be relatively constant when the difference between the extreme temperatures noted during the test does not exceed 5° C and the variation over time does not exceed 5° C per hour.

A.2.4 Before the start of a test, the equipment under test (EUT) must be energized for a period of time at least equal to the warm-up time specified by the manufacturer. The EUT must remain energized throughout the duration of the test.

A.3 Tests

Test	Characteristics under test	Conditions applied
A.3.1 Static temperatures	Influence factor	MPE
A.3.2 Damp heat, steady state	Influence factor	MPE
A.3.3 Power voltage variation	Influence factor	MPE
A.3.4 Short time power reduction	Disturbance	sf
A.3.5 Bursts	Disturbance	sf
A.3.6 Electrostatic discharge	Disturbance	sf
A.3.7 Electromagnetic susceptibility	Disturbance	sf

A.3 Tests

A.3.1 Static Temperatures

Test method: Dry heat (non condensing) and cold.

Object of the test: To verify compliance with the applicable MPE under conditions of high and low temperature.

Reference to standard: See Bibliography (1).

Test procedure in brief: The test consists of exposure of the EUT to the high and low temperatures specified in section 2.2.4.1 for belt scales, section 3.2.4.1 for automatic hopper scales, and section 4.2.3.1 for platform scales and hanging scales, under "free air" condition for a 2-hour period after the EUT has reached temperature stability. The EUT must be tested during a weighing operation consisting of:

For belt scales—the totalization of the Σ_{min} , 2 times each at approximately the minimum flow rate, an intermediate flow rate, and the maximum flow rate.

For platform, hanging, and automatic hopper scales—tested with at least five different test loads or simulated loads under the following conditions:

a. At a reference temperature of 20° C following conditioning.

b. At the specified high temperature, 2 hours after achieving temperature stabilization.

c. At the specified low temperature, 2 hours after achieving temperature stabilization.

d. At a temperature of 5° C, 2 hours after achieving temperature stabilization.

e. After recovery of the EUT at the reference temperature of 20° C.

Test severities: Duration: 2 hours.

Number of test cycles: At least one cycle.

Maximum allowable variations:

- a. All functions must operate as designed.
- b. All indications must be within the applicable MPEs.

Conduct of test: Refer to the International Electrotechnical Commission (IEC) Publications mentioned in section A.4 Bibliography (a) for detailed test procedures.

Supplementary information to the IEC test procedures.

Preconditioning: 16 hours.

Condition of EUT: Normal power supplied and "on" for a time period equal to or greater than the warm-up time specified by the manufacturer. Power is to be "on" for the duration of the test. Adjust the EUT as close to a zero indication as practicable prior to the test.

Test Sequence:

a. Stabilize the EUT in the chamber at a reference temperature of 20° C. Conduct the tests as specified in the test procedure in brief and record the following data:

- i. Date and time,
- ii. Temperature,
- iii. Relative humidity,
- iv. Test load,
- v. Indication,
- vi. Errors, and
- vii. Functions performance.

b. Increase the temperature in the chamber to the high temperature specified. Check by measurement that the EUT has reached temperature stability and maintain the temperature for 2 hours. Following the 2 hours, repeat the tests and record the test

data indicated in this A.3.1 Test Sequence section.

c. Reduce the temperature in the chamber as per the IEC procedures to the specified low temperature. After temperature stabilization, allow the EUT to soak for 2 hours. Following the 2 hours, repeat the tests and record the test data as indicated in this A.3.1 Test Sequence section.

d. Raise the temperature in the chamber as per the IEC procedures to 5° C. After temperature stabilization, allow the EUT to soak for 2 hours. Following the 2 hours, repeat the tests and record the test data as indicated in this A.3.1 Test Sequence section. **Note:** This test relates to a -10° C to +40° C range. For special ranges, it may not be necessary.

e. Raise the temperature in the chamber as per the IEC procedures and to the 20° C reference temperature. After recovery, repeat the tests and record the test data as indicated in this A.3.1 Test Sequence section.

A.3.2 Damp Heat, Steady State

Test method: Damp heat, steady state.

Object of the test: To verify compliance with the applicable MPE under conditions of high humidity and constant temperature.

Reference to standard: See section A.4 Bibliography (b)

Test procedure in brief: The test consists of exposure of the EUT to a constant temperature at the upper limit of the temperature range and of a constant relative humidity of 85 percent for a 2-day period. The EUT must be tested during a weighing operation consisting of the following:

For belt scales—the totalization of the Σ_{min} , 2 times each at approximately the minimum

flow rate, an intermediate flow rate, and the maximum flow rate.

For platform, hanging, and automatic hopper scales—tested with at least five different test loads or simulated loads at a reference temperature of 20° C and a relative humidity of 50 percent following conditioning, and at the upper limit temperature and a relative humidity of 85 percent 2 days following temperature and humidity stabilization.

Test severities:

Temperature: upper limit.
Humidity: 85 percent (non-condensing).
Duration: 2 days.
Number of test cycles: At least one test.

Maximum Allowable Variations:

- All functions must operate as designed.
- All indications must be within the applicable MPE.

Conduct of the test: Refer to the IEC Publications mentioned in section A.4 Bibliography (b) for detailed test procedures. *Supplementary information to the IEC test procedures.*

Preconditioning: None required.

Condition of EUT:

a. Normal power supplied and "on" for a time period equal to or greater than the warm-up time specified by the manufacturer. Power is to be "on" for the duration of the test.

b. The handling of the EUT must be such that no condensation of water occurs on the EUT.

c. Adjust the EUT as close to a zero indication as practicable prior to the test.

Test Sequence:

a. Allow 3 hours for stabilization of the EUT at a reference temperature of 20° C and a relative humidity of 50 percent. Following stabilization, conduct the tests as specified in the test procedures in brief and record the following data:

- Date and time,
- Temperature,
- Relative humidity,
- Test load,
- Indication,
- Errors, and
- Functions performance.

b. Increase the temperature in the chamber to the specified high temperature and a relative humidity of 85 percent. Maintain the EUT at no load for a period of 2 days. Following the 2 days, repeat the tests and record the test data as indicated in this A.3.2

Test Sequence section.

c. Allow full recovery of the EUT before any other tests are performed.

A.3.3 Power Voltage Variation

A.3.3.1 AC Power Supply

Test method: Variation in AC mains power supply (single phase).

Object of the test: To verify compliance with the applicable MPEs under conditions of varying AC mains power supply.

Reference to standard: See section A.4 Bibliography (c).

Test procedure in brief: The test consists of subjecting the EUT to AC mains power during a weighing operation consisting of the following:

For belt scales—while totalizing the Σ_{min} at the maximum flow rate.

For platform, hanging, and automatic hopper scales—at no load and a test load between 50 percent and 100 percent of weighing capacity.

Test severities: Mains voltage:

Upper limit U (nom) +10 percent.

Lower limit U (nom) -15 percent.

Number of test cycles: At least one cycle.

Maximum allowable variations:

- All functions must operate correctly.
- All indications must be within MPEs specified in sections 2, 3, or 4 of this appendix to part 679.

Conduct of the test:

Preconditioning: None required.

Test equipment:

- Variable power source.
- Calibrated voltmeter, and
- Load cell simulator, if applicable.

Condition of EUT:

a. Normal power supplied and "on" for a time period equal to or greater than the warm-up time specified by the manufacturer.

b. Adjust the EUT as close to a zero indication as practicable prior to the test.

Test sequence:

a. Stabilize the power supply at nominal voltage ± 2 percent.

b. Conduct the tests specified in the test procedure in brief and record the following data:

- Date and time,
- Temperature,
- Relative humidity,
- Power supply voltage,
- Test load,
- Indications,
- Errors, and
- Functions performance.

c. Reduce the power supply to -15 percent nominal.

d. Repeat the test and record the test data as indicated in this A.3.3 Test Sequence section.

e. Increase the power supply to +10 percent nominal.

f. Repeat the test and record the test data as indicated in this A.3.3 Test Sequence section.

g. Unload the EUT and decrease the power supply to nominal power ± 2 percent.

h. Repeat the test and record the test data as indicated in this A.3.3 Test Sequence section.

NOTE: In case of three-phase power supply, the voltage variation must apply for each phase successively. Frequency variation applies to all phases simultaneously.

A.3.3.2 DC Power Supply

Under consideration.

A.3.4 Short Time Power Reduction

Test method: Short time interruptions and reductions in mains voltage.

Object of the test: To verify compliance with the applicable significant fault under conditions of short time mains voltage interruptions and reductions.

Reference to standard: See section A.4 Bibliography (d) IEC Publication 1000-4-11 (1994).

Test procedure in brief: The test consists of subjecting the EUT to voltage interruptions from nominal voltage to zero voltage for a period equal to 8-10 ms. and from nominal voltage to 50 percent of nominal for a period equal to 16-20 ms. The mains voltage interruptions and reductions must be repeated ten times with a time interval of at least 10 seconds. This test is conducted during a weighing operation consisting of the following:

For belt scales—while totalizing at the maximum flow rate at least the Σ_{min} (or a time sufficient to complete the test).

For platform, hanging, and automatic hopper scales—tested with one small test load or simulated load.

Test severities: One hundred percent voltage interruption for a period equal to 8-10 ms. Fifty percent voltage reduction for a period equal to 16-20 ms.

Number of test cycles: Ten tests with a minimum of 10 seconds between tests.

Maximum allowable variations: The difference between the weight indication due to the disturbance and the indication without the disturbance either must not exceed 1d or the EUT must detect and act upon a significant fault.

Conduct of the Test:

Preconditioning: None required.

Test equipment:

- A test generator suitable to reduce the amplitude of the AC voltage from the mains. The test generator must be adjusted before connecting the EUT.
- Load cell simulator, if applicable.

Condition of EUT:

a. Normal power supplied and "on" for a time period equal to or greater than the warm-up time specified by the manufacturer.

b. Adjust the EUT as close to zero indication as practicable prior to the test.

Test sequence:

a. Stabilize all factors at nominal reference conditions.

b. Totalize as indicated in this A.3.4 Test Sequence section and record the—

- Date and time,
- Temperature,
- Relative humidity,
- Power supply voltage,
- Test load,
- Indications,
- Errors, and
- Functions performance.

c. Interrupt the power supply to zero voltage for a period equal to 8-10 ms. During interruption observe the effect on the EUT and record, as appropriate.

d. Repeat the steps four times in this A.3.4 Test Sequence section, making sure that there is a 10 second interval between repetitions. Observe the effect on the EUT.

e. Reduce the power supply to 50 percent of nominal voltage for a period equal to 16-20 ms. During reduction observe the effect on the EUT and record, as appropriate.

f. Repeat the steps four times in this A.3.4 Test Sequence section, making sure that there is a 10 second interval between repetitions. Observe the effect on the EUT.

A.3.5 Bursts

Test method: Electrical bursts.

Object of the test: To verify compliance with the provisions in this manual under conditions where electrical bursts are superimposed on the mains voltage.

Reference to standard: See section A.4 Bibliography (e)

Test Procedure in brief:

The test consists of subjecting the EUT to bursts of double exponential wave-form transient voltages. Each spike must have a rise in time of 5 ns and a half amplitude duration of 50 ns. The burst length must be 15 ms, the burst period (repetition time interval) must be 300 ms. This test is conducted during a weighing operation consisting of the following:

For belt scales—while totalizing at the maximum flow rate at least the Σ_{\min} (or a time sufficient to complete the test).

For platform, hanging, and automatic hopper scales—tested with one small test load or simulated load.

Test severities: Amplitude (peak value) 1000 V.

Number of test cycles: At least 10 positive and 10 negative randomly phased bursts must be applied at 1000 V.

Maximum allowable variations: The difference between the indication due to the disturbance and the indication without the disturbance either must not exceed the values given in sections 2.2.1.1b., 3.2.1.1b., and 4.2.1.1b. of this appendix, or the EUT must detect and act upon a significant fault.

Conduct of the test: Refer to the IEC Publication referenced in section A.4 Bibliography (e) for detailed test procedures.

Supplementary information to the IEC test procedures:

Test equipment:

A burst generator having an output impedance of 50 ohms.

Test conditions:

The burst generator must be adjusted before connecting the EUT. The bursts must be coupled to the EUT both on common mode and differential mode interference.

Condition of EUT:

a. Normal power supplied and "on" for a time period equal to or greater than the warm-up time specified by the manufacturer.

b. Adjust the EUT as close to a zero indication as practicable prior to the test.

Test Sequence:

a. Stabilize all factors at nominal reference conditions.

b. Conduct the test as indicated in this A.3.5 Test Sequence section and record the—

- i. Date and time,
- ii. Temperature,
- iii. Relative humidity,
- iv. Test load,
- v. Indication,
- vi. Errors, and
- vii. Functions performance.

c. Subject the EUT to at least 10 positive and 10 negative randomly phased bursts at the 1000 V mode. Observe the effect on the EUT and record, as appropriate.

d. Stabilize all factors at nominal reference conditions.

e. Repeat the test and record the test data as indicated in this A.3.5 Test Sequence section.

A.3.6 Electrostatic Discharge

Test method: Electrostatic discharge (ESD).

Object of the test: To verify compliance with the provisions of this manual under conditions of electrostatic discharges.

Reference to standard: See section A.4 Bibliography (f)

Test procedure in brief:

A capacitor of 150 pF is charged by a suitable DC voltage source. The capacitor is then discharged through the EUT by connecting one terminal to ground (chassis) and the other via 150 ohms to surfaces which are normally accessible to the operator. This test is conducted during a weighing operation consisting of the following:

For belt scales—while totalizing at the maximum flow rate at least the Σ_{\min} (or a time sufficient to complete the test).

For platform, hanging, and automatic hopper scales—test with one small test load or simulated load.

Test severities

Air Discharge: up to and including 8 kV.

Contact Discharge: up to and including 6 kV.

Number of test cycles: At least 10 discharges must be applied at intervals of at least 10 seconds between discharges.

Maximum allowable variations:

The difference between the indication due to the disturbance and the indication without the disturbance either must not exceed the values indicated in sections 2.2.1.1 b., 3.2.1.1 b., and 4.2.1.1 b. of this appendix, or the EUT must detect and act upon a significant fault.

Conduct of the test: Refer to the IEC Publication mentioned in section A.4 Bibliography (d) for detailed test procedures.

Supplementary information to the IEC test procedures:

Preconditioning: None required.

Condition of EUT:

a. The EUT without a ground terminal must be placed on a grounded plate which projects beyond the EUT by at least 0.1 m on all sides. The ground connection to the capacitor must be as short as possible.

b. Normal power supplied and "on" for a time period equal to or greater than the warm-up time specified by the manufacturer. Power is to be "on" for the duration of the test.

c. The EUT must be operating under standard atmospheric conditions for testing.

d. Adjust the EUT as close to a zero indication as practicable prior to the test.

Test sequence:

a. Stabilize all factors at nominal reference conditions.

b. Conduct test as indicated in this A.3.6 Test Sequence section and record the—

- i. Date and time,
- ii. Temperature,
- iii. Relative humidity,
- iv. Power supply voltage,
- v. Test load,
- vi. Indication,
- vii. Errors, and

viii. Functions performance.

c. Approach the EUT with the discharge electrode until discharge occurs and then remove it before the next discharge. Observe the effect of the discharge on the EUT and record, as appropriate.

d. Repeat the above step at least nine times, making sure to wait at least 10 seconds between successive discharges. Observe the effect on the EUT and record as appropriate.

e. Stabilize all factors at nominal reference conditions.

f. Repeat the test and record the test data as indicated in this A.3.6 Test Sequence section.

A.3.7 Electromagnetic Susceptibility

Test method: Electromagnetic fields (radiated).

Object of the Test:

To verify compliance with the provisions in this manual under conditions of electromagnetic fields.

Reference to standard: See section A.4 Bibliography (g).

Test procedure in brief:

a. The EUT is placed in an EMI chamber and tested under normal atmospheric conditions. This test is first conducted at one load in a static mode, and the frequencies at which susceptibility is evident are noted. Then tests are conducted at the problem frequencies, if any, during a weighing operation consisting of the following:

For belt scales—while totalizing at the maximum flow rate at least the Σ_{\min} (or a time sufficient to complete the test). It is then exposed to electromagnetic field strengths as specified in the Test severities in this section A.3.7 of this annex to appendix A of this part.

For platform, hanging, and automatic hopper scales—tested with one small test load.

b. The field strength can be generated in various ways:

- i. The strip line is used at low frequencies (below 30 MHz or in some cases 150 MHz) for small EUT's;
- ii. The long wire is used at low frequencies (below 30 MHz) for larger EUT's;
- iii. Dipole antennas or antennas with circular polarization placed 1 m from the EUT are used at high frequencies.

c. Under exposure to electromagnetic fields the EUT is again tested as indicated above.

Test severities: Frequency range: 26–1000 MHz.

Field strength: 3 V/m.

Modulation: 80 percent AM, 1 kHz sine wave.

Number of test cycles: Conduct test by continuously scanning the specified frequency range while maintaining the field strength.

Maximum allowable variations: The difference between the indication due to the disturbance and the indication without the disturbance either must not exceed the values given in this manual, or the EUT must detect and act upon a significant fault.

Conduct of the test: Refer to the IEC Publication referenced in section A.4 Bibliography (g) for detailed information on test procedures.

Supplementary information to the IEC test procedures.

Test conditions:

a. The specified field strength must be established prior to the actual testing (without the EUT in the field). At least 1 m of all external cables must be included in the exposure by stretching them horizontally from the EUT.

b. The field strength must be generated in two orthogonal polarizations and the frequency range scanned slowly. If antennas with circular polarization, *i.e.*, log-spiral or helical antennas, are used to generate the electromagnetic field, a change in the position of the antennas is not required. When the test is carried out in a shielded enclosure to comply with international laws prohibiting interference to radio communications, care needs to be taken to handle reflections from the walls. Anechoic shielding might be necessary.

Condition of EUT:

a. Normal power supplied and "on" for a time period equal to or greater than the warm-up time specified by the manufacturer. Power is to be "on" for the duration of the test. The EUT must be operating under standard atmospheric conditions for testing.

b. Adjust the EUT as close to a zero indication as practicable prior to the test.

Test sequence:

a. Stabilize all factors at nominal reference conditions.

b. Conduct the test as indicated in this A.3.7 Test Sequence section and record the—
i. Date and time.

- ii. Temperature,
- iii. Relative humidity,
- iv. Test load,
- v. Indication,
- vi. Errors, and
- vii. Functions performance.

c. Following the IEC test procedures, expose the EUT at zero load to the specified field strengths while slowly scanning the three indicated frequency ranges.

d. Observe and record the effect on the EUT.

e. Repeat the test and observe and record the effect.

f. Stabilize all factors at nominal reference conditions.

g. Repeat the test and record the test data.

A.4 Bibliography

Below are references to Publications of the International Electrotechnical Commission (IEC), where mention is made in the tests in annex A to appendix A of this part.

a. IEC Publication 68-2-1 (1974): Basic environmental testing procedures, Part 2: Tests, Test Ad: Cold, for heat dissipating equipment under test (EUT), with gradual change of temperature.

IEC Publication 68-2-2 (1974): Basic environmental testing procedures, Part 2: Tests, Test Bd: Dry heat, for heat dissipating equipment under test (EUT) with gradual change of temperature.

IEC Publication 68-3-1 (1974): Background information, Section 1: Cold and dry heat tests.

b. IEC Publication 68-2-56 (1988): Environmental testing, Part 2: Tests, Test Cb: Damp heat, steady state. Primarily for equipment.

IEC Publication 68-2-28 (1980): Guidance for damp heat tests.

c. IEC Publication 1000-4-11 (1994): Electromagnetic compatibility (EMC) Part 4: Testing and measurement techniques, Section 11: Voltage dips, short interruptions and voltage variations immunity tests. Section 5.2 (Test levels—Voltage variation). Section 8.2.2 (Execution of the test-voltage variation).

d. IEC Publication 1000-4-11 (1994): Electromagnetic compatibility (EMC) Part 4: Testing and measurement techniques, Section 11: Voltage dips, short interruptions and voltage variations immunity tests. Section 5.1 (Test levels—Voltage dips and short interruptions). Section 8.2.1 (Execution of the test-voltage dips and short interruptions) of the maximum transit speed and the range of operating speeds.

e. IEC Publication 1000-4-4 (1995): Electromagnetic compatibility (EMC) Part 4: Testing and measurement techniques—Section 4: Electrical fast transient/burst immunity test. Basic EMC publication.

f. IEC Publication 1000-4-2 (1995): Electromagnetic compatibility (EMC) Part 4: Testing and measurement techniques—Section 2: Electrostatic discharge immunity test. Basic EMC Publication.

g. IEC Publication 1000-4-3 (1995): Electromagnetic compatibility (EMC) Part 4: Testing and measurement techniques—Section 3: Radiated, radio-frequency electromagnetic field immunity test.

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