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IS 1656 (2007): Milk-Cereal Based Complementary foods [FAD  
19: Dairy Products and Equipment]



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IS 1656 : 2007

Reaffirmed 2009

भारतीय मानक

दुग्ध-अनाज आधारित अनुपूरक आहार — विशिष्टि  
( चौथा पुनरीक्षण )

*Indian Standard*

MILK-CEREAL BASED COMPLEMENTARY  
FOODS — SPECIFICATION

( *Fourth Revision* )

First Reprint JUNE 2007

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BUREAU OF INDIAN STANDARDS  
MANAK BHAVAN 9 BAHADUR SHAH ZAFAR MARG  
NEW DELHI 110002

January 2007

Price Group 3

**AMENDMENT NO. 2 NOVEMBER 2012**  
**TO**  
**IS 1656 : 2007 MILK-CEREAL BASED**  
**COMPLEMENTARY FOODS — SPECIFICATION**

*( Fourth Revision )*

*(Page 4, Table 1, Sl No. (i), col 4) — Substitute 'IS 11623 for reference purpose and IS 16072 for routine purpose' for 'IS 11623'.*

*(Page 5, Annex A) — Insert the following at the end:*

*'IS No.*

*Title*

16072 : 2012

Determination of moisture content in milk powder and similar products (Routine method)'.

(FAD 19)

**AMENDMENT NO. 1 AUGUST 2007  
TO  
IS 1656 : 2007 MILK-CEREAL BASED  
COMPLEMENTARY FOODS —  
SPECIFICATION**

*( Fourth Revision )*

*(Page 1, clause 5.2, line 2) — Substitute 'protein' for 'casein'*

*[Page 4, Table 1, Sl No. (ii), col 3] — Substitute '1.80' for '12.0'*

*[Page 4, Table 1, Sl No. (x), col 3] — Substitute '1.0' for '0.1'*

(FAD 19)

## FOREWORD

This Indian Standard (Fourth Revision) was adopted by the Bureau of Indian Standards, after the draft finalized by the Dairy Products and Equipments Sectional Committee had been approved by the Food and Agriculture Division Council

This standard was first published in 1960 and subsequently revised in 1969, 1985 and then in 1997 to harmonize the standard with Statutory Rules and Regulations. In this revision, recommendatory list of sources of vitamin compounds and minerals salts, list of permitted Food Additives have been included and the chemical and microbiological requirements updated. In view of the above inclusions and updations, the standard is harmonized with the standards for milk cereal based complementary foods laid down under the *Prevention of Food Adulteration Rules, 1955*.

Milk cereal based complementary foods are mainly intended to accustom the infant's digestive tract to solid foods. Nutritionally, this category of foods serve as an important source of calories to meet the energy requirements due to increased physical activity of infant. Beginning with the introduction of cereals after four months of age, the intake is slowly increased so that by 8 months of age and onwards nearly half of the total intake is from milk and remaining from cereals and a variety of other foods. With such a feeding practice milk almost completely meets the protein requirements while cereals and/or other foods meet the energy and satiety requirements of the infant.

Under the *Infant Milk Substitutes, Feeding Bottles and Infant Foods (Regulation of Production, Supply and Distribution) Act, 1992* various types of foods for infants being marketed in our country have been placed under the following two categories:

- a) Infant milk substitutes and
- b) Infant foods

'Infant milk substitute' means any food being marketed or otherwise represented as partial or total replacement for mother's milk whereas 'Infant food' means any food being marketed or otherwise represented as a complement to mother's milk to meet the growing nutritional needs of the infant after the age of six months.

At present mainly two types of infant foods are being marketed in our country namely milk cereal based complementary foods and processed cereal based complementary foods. This standard covers the requirements for milk-cereal based complementary foods and a separate standard, namely, IS 11536:1997 Specification for processed cereal based complementary foods for infants.

While formulating this standard, due consideration has been given to the relevant rules prescribed by the Government of India, namely *Prevention of Food Adulteration Rules, 1955*, *Infant Milk Substitutes, Feeding Bottles and Infant Foods (Regulation of Production, Supply and Distribution) Act, 1992* and *Rules 1993*, and *Third Schedule of the Standards of Weights and Measures (Packaged Commodities) Rules, 1977*.

The various statutory Rules indicated were valid at the time of publication of this standard. Since the statutory Rules and Acts are updated from time-to-time, this standard is subject to the restrictions imposed under these Acts and Rules wherever applicable.

A scheme for labelling environment friendly products known as ECO Mark has been introduced at the instance of the Ministry of Environment and Forests (MEF), Government of India. The ECO-Mark shall be administered by the Bureau of Indian Standards (BIS) under the *BIS Act, 1986* as per the Resolution No. 71 dated 20 February 1991 and No. 425 dated 28 October 1992 published in the Gazette of the Government of India. For a product to be eligible for marking with the ECO Mark, it shall also carry the Standard Mark of BIS for quality besides meeting additional environment friendly (EF) requirements given in the standard, which are based on the Gazette Notification No. GSR 624 (E) dated 6 September 1995 for labelling beverages, infant foods and processed fruits and vegetable products as Environment Friendly Products, published in the Gazette of the Government of India.

For the purpose of deciding whether a particular requirement of this standard is complied with, the final value, observed or calculated, expressing the result of a test or analysis, shall be rounded off in accordance with IS 2:1960 'Rules for rounding off numerical values (*revised*)'. The number of significant places retained in the rounded off value should be the same as that of the specified value in this standard.

# Indian Standard

## MILK-CEREAL BASED COMPLEMENTARY FOODS — SPECIFICATION

### ( Fourth Revision )

#### 1 SCOPE

This standard prescribes the requirements, methods of test and sampling for milk-cereal based complementary foods intended for feeding infants at the weaning stage

#### 2 REFERENCES

The Indian Standards listed in Annex A contain provisions which through reference in this text, constitute provisions of this standard. At the time of publication, the editions indicated were valid. All standards are subject to revision and parties to agreements based on this standard are encouraged to investigate the possibility of applying the most recent editions of the standards indicated.

#### 3 TERMINOLOGY

For the purpose of this standard, the following definitions shall apply

##### 3.1 Milk-Cereal Based Complementary Food —

Milk-cereal based complementary foods commonly called as weaning foods or supplementary foods means foods are obtained from milk, variety of cereals, pulses, soyabeans, millets, nuts and edible oilseeds after processing to low moisture content. It may contain edible vegetable oils, milk solids, fruits and vegetables, egg and egg products, different carbohydrates such as sucrose, dextrose, dextrins/maltodextrin, maltose and lactose, iron and calcium salts, phosphates and citrates and other nutritionally significant minerals and vitamins.

Milk cereal based complementary foods are intended to supplement the diet of infants after the age of six months and up to the age of two years.

**3.2 Routine Tests** — Tests carried out on each lot to check the essential requirements which are likely to vary during production.

**3.3 Type Test** — The tests to prove conformity to the requirements of this standard. These are intended to approve the formulation and quality of the product at

least in the beginning of marketing or certification or both. These tests are also conducted periodically to supplement the routine tests, or whenever the basic formula or method is changed.

#### 4 DESCRIPTION

The milk-cereal based complementary food shall be in the form of powder, small granules or flakes, free from lumps so as to permit dilution with water, milk or other suitable medium and shall be uniform in appearance.

#### 5 REQUIREMENTS

**5.1** The milk-cereal based complementary food shall be free from dirt and extraneous matter, preservatives, added colour, added flavour. It shall be reasonably free from scorched particles. It shall also be free from any material which is harmful to human health.

**5.2** It shall contain a minimum of 10 percent milk casein by mass of the product and a minimum of 5 percent milk fat by mass of the product. It shall not contain hydrogenated fats containing trans fatty acids. It may contain fungal alpha amylase up to a maximum extent of 0.025 percent by mass. It may also include aminoacids such as lysine, methionine, taurine, carnitine etc.

NOTE — Since there is no reliable method at present for the estimation of separate contents of milk fat and vegetable fat in the infant food, records for these shall be maintained by the manufacturer.

**5.3** The product may contain food additives listed below

<i>Food Additives</i>	<i>Maximum Level in 100 g of the Product on a Dry Weight Basis</i>
<b>Emulsifiers:</b>	
Lecithin	1.5 g
Mono- and Diglycerides	1.5 g



<i>Food Additives</i>	<i>Maximum Level in 100 g of the Product on a Dry Weight Basis</i>
<b>pH-Adjusting Agents:</b>	
Sodium hydrogen carbonate	} Limited by good manufacturing practice and within the limits for sodium
Sodium carbonate	
Sodium citrate	
Potassium hydrogen carbonate	
Potassium carbonate	
Potassium citrate	
Sodium hydroxide	
Calcium hydroxide	
Potassium hydroxide	
L (+) Lactic acid	
Citric acid	
<b>Antioxidants:</b>	
Mixed tocopherols concentrate $\alpha$ tocopherol	} 300 mg/kg fat, singly or in combination
L-Ascorbyl palmitate	
	200 mg/kg fat

## 5.4 Quality of Ingredients

5.4.1 All ingredients used shall be clean, of good quality, safe and suitable for ingestion by infants

5.4.2 The vitamins and minerals shall be of food grade. Iron salts should be such so as to ensure high bio-availability of iron. The source of mineral salts and vitamin compounds may be used from

### a) Minerals

- 1) *Calcium* (Ca) — Calcium carbonate, calcium phosphate tribasic, calcium sulphate
- 2) *Phosphorous* (P) — Calcium phosphate tribasic,
- 3) *Chloride* (Cl) — Sodium chloride,
- 4) *Iron* (Fe) — Hydrogen reduced iron, electrolytic iron,
- 5) *Magnesium* (Mg) — Magnesium chloride, magnesium oxide, magnesium phosphate dibasic,
- 6) *Sodium* (Na) — Sodium chloride,
- 7) *Zinc* (Zn) — Zinc sulphate,

### b) Vitamins

- 1) *Vitamin A* — Retinyl acetate, retinyl palmitate, retinyl propionate
- 2) *Provitamin A* — Beta-carotene,
- 3) *Vitamin D* — *Vitamin D<sub>2</sub>* — Ergocalciferol, *Vitamin D<sub>3</sub>* — Cholecalciferol, cholecalciferol-cholesterol,

- 4) *Vitamin E* — d- $\alpha$ -tocopherol, dl- $\alpha$ -tocopherol, d- $\alpha$ -tocopheryl acetate, dl- $\alpha$ -tocopheryl acetate, d- $\alpha$ -tocopheryl succinate, dl- $\alpha$ -tocopheryl succinate,
- 5) *Thiamin* (*Vitamin B<sub>1</sub>*) — Thiamin chloride hydrochloride, thiamin mononitrate,
- 6) *Riboflavin* (*Vitamin B<sub>2</sub>*) — Riboflavin, riboflavin 5' — phosphate sodium,
- 7) *Niacin* — Nicotinamide, nicotinic acid,
- 8) *Vitamin B<sub>6</sub>* — Pyridoxine hydrochloride,
- 9) *Biotin* (*Vitamin H*) — d-biotin,
- 10) *Folacin* — Folic acid,
- 11) *Pantothenic acid* — Calcium pantothenate, Panthenol,
- 12) *Vitamin B<sub>12</sub>* — Cyanocobalamin, hydroxycobalamin,
- 13) *Vitamin K* — Phytylmenaquinone,
- 14) *Vitamin C* — Ascorbic acid, sodium ascorbate, calcium ascorbate, ascorbyl-6-palmitate,
- 15) *Choline* — Choline bitartrate, choline chloride,
- 16) *Inositol*, and
- 17) *Selenium* — Sodium selenite

## 5.5 Hygienic Conditions

The material shall be manufactured and packed under hygienic conditions (see IS 2491)

## 5.6 Flavour and Odour

The flavour and odour of the milk-cereal based complementary food in the powder form or when reconstituted with water shall be fresh and sweet (see IS 10641). It shall not have a rancid taste or a musty odour.

## 5.7 Bacteriological Specifications

### 5.7.1 Bacterial Count

The bacterial colony count per gram of the product shall not be more than 10 000 when determined according to the method prescribed in IS 5402.

### 5.7.2 Coliform Count

The coliform bacteria shall be absent per 0.1 g of the product when determined according to the method prescribed in IS 5401 (Part 1).

### 5.7.3 *Escherichia Coli*

*Escherichia coli* shall be absent per 0.1 g of the product when tested as per the method prescribed in IS 5887 (Part 1).

### 5.7.4 *Staphylococcus Aureus*

*Staphylococcus aureus* shall be absent per 0.1 g of the

product when tested as per the method prescribed in IS 5887 (Part 2)

#### 5.7.5 *Salmonella and Shigella*

*Salmonella* and *Shigella* shall be absent per 25 g of the product when tested as per the method prescribed in IS 5887 (Part 3) and IS 5887 (Part 7) respectively (see Note)

NOTE — The requirements for *Salmonella* and *Shigella* shall be tested in a laboratory situated away from the production area

#### 5.7.6 *Yeast and Mould Count*

Yeast and mould shall be absent per 0.1 g of the product when tested as per IS 5403

5.8 The milk-cereal based complementary food shall also comply with the requirements given in Table 1

### 5.9 Optional Requirements for ECO-Mark

#### 5.9.1 *General Requirements*

5.9.1.1 The product shall conform to the requirements prescribed under 5.1 to 5.7

5.9.1.2 The manufacturers shall produce the consent clearance as per the provisions of *Water (PCP) Act* 1974, *Water (PCP) Cess Act* 1977 and *Air (PCP) Act* 1981 along with the authorization if required under *Environment (Protection) Act* 1986 and the Rules made thereunder to the Bureau of Indian Standards, while applying for the ECO-Mark and the product shall also be in accordance with the *Prevention of Food Adulteration Act* 1954 and the Rules made thereunder. Additionally, *FPO* 1955 (*Food Product Order*) framed under *Essential Commodities Act* 1966, *Standards of Weights and Measures Act* 1977 and 1985 requirements wherever applicable, has to be complied with

5.9.1.3 The product/packaging may also display in brief the criteria based on which the product has been labelled environment friendly

5.9.1.4 The material used for product packing shall be recyclable or biodegradable

5.9.1.5 The date of manufacture and date of expiry shall be declared on the product package by the manufacturer.

5.9.1.6 The product shall be microbiologically safe when tested as per IS 5887 (Part 5) and should be free from bacterial and fungal toxins

5.9.1.7 The pesticide residues (if any) in the product shall not exceed the limit as prescribed in *PFA Act*, 1954 and the Rules made thereunder

5.9.1.8 The product package or leaflet accompanying it may display instruction of proper use, storage and

transport (including refrigeration temperature compliance) so as to maximize the product performance safety and minimize wastage

#### 5.9.2 *Specific Requirements*

5.9.2.1 The material used inside the metal cap of the product shall conform to the relevant Indian Standards of food grade plastics as permitted under the *Prevention of Food Adulteration Act* 1954 and the Rules made thereunder. Caps and closures shall not be treated as labels

5.9.2.2 The percentage of fruit juice/pulp, if any added shall be mentioned on the product package

5.9.2.3 No synthetic food colour and artificial sweetener shall be added or used in the product

5.9.2.4 Product shall be free from aflatoxins when tested in accordance with the method prescribed in Appendix J of IS 4684

## 6 PACKING AND MARKING

### 6.1 Packing

The milk cereal based complementary foods shall be packed in hermetically sealed clean and sound metal containers (see IS 11078) or in a flexible pack so as to protect it from deterioration. In case plastic material is used for flexible packaging, only food grade plastic shall be used (see IS 10111)

6.1.1 The infant food shall be packed in quantities as stipulated under *Standards of Weights and Measures (Packaged Commodities) Rules* 1977 as well as in accordance with requirements under *PIA Act* 1954 and *Rules*, 1955

### 6.2 Marking

6.2.1 The containers shall bear legibly and indelibly the following information

- a) Name of the material, and brand name, if any
- b) Name and address of the manufacturer,
- c) Batch or Code number,
- d) Month and year of manufacturing or packing,
- e) Net mass (see 6.1.1),
- f) Date before which the contents should be consumed be indicated by marking the words 'Use before (month and year) .
- g) *Composition* — Indicating the approximate composition of nutrients per 100 g of the product as well as the energy value in joules.
- j) Feed chart and directions for use and

**Table 1 Requirements for Milk-Cereal Based Complementary Foods**  
(Clause 5.8)

Sl No	Characteristic	Requirement	Method of test Ref to
(1)	(2)	(3)	(4)
i)	Moisture g/100 g <i>Max</i>	5.0	IS 11623
ii)	Total protein g/100 g <i>Min</i>	12.0	IS 7219
iii)	Fat g/100 g <i>Min</i>	7.5	Annex B
iv)	Total carbohydrates g/100 g <i>Min</i>	55.0	Annex C
v)	Total ash g/100 g <i>Max</i>	5.0	Annex B of IS 14433
vi)	Acid insoluble ash g/100 g <i>Max</i>	0.1	Annex C of IS 14433
vii)	Vitamin A (as retinol) µg/100 g <i>Min</i>	150	IS 5886
viii)	Vitamin C mg/100 g <i>Min</i>	25	IS 5838
ix)	Iron mg/100 g <i>Min</i>	5.0	Annex D of IS 14433
x)	Crude fibre (on dry basis) g/100 g <i>Max</i>	0.1	IS 10226 (Part I)
xi)	Added vitamin D (expressed as cholecalciferol or ergocalciferol) µg/100 g <i>Min</i>	5	IS 5835
xii)	Thiamine mg/100 g <i>Min</i>	0.5	IS 5398
xiii)	Riboflavin mg/100 g <i>Min</i>	0.3	IS 5399
xiv)	Niacin mg/100 g <i>Min</i>	3.0	IS 5400
xv)	Folic acid µg/100 g <i>Min</i>	20	IS 7234
xvi)	Zinc mg/100 g		
	<i>Min</i>	2.5	Clause 15 of IS 1699
	<i>Max</i>	5.0	
xvii)	Copper µg/100 g		
	<i>Min</i>	280	Clause 15 of IS 1699
	<i>Max</i>	1 500	
xviii)	Heavy metals		
	a) Lead mg/kg <i>Max</i>	0.2	IS 12074
	b) Arsenic mg/kg <i>Max</i>	0.05	IS 11124
	c) Tin mg/kg <i>Max</i>	5.0	Clause 17 of IS 2860
	d) Cadmium mg/kg <i>Max</i>	0.1	Clause 15 of IS 1699

**NOTES**

1. For the purpose of Type tests, all tests mentioned above are to be carried out and for the purpose of routine tests, the tests given from Sl No. (i) to (ix) are to be carried out.

2. The Indian Standards on methods of test indicated in col 4 against Sl No. (xi), (xii), (xiii) and (xiv) are presently given for guidance only, they are under revision at present. As there is no other suitable and easily workable method at present for determining Vitamin D, Thiamine, Riboflavin and Nicotinic acid content of a product like milk cereal based complementary foods, the manufacturers would be required to maintain a record showing the quantity of these added vitamins added to each batch.

k) Any other requirements as stipulated under *PFA Rules, 1955, Infant Milk Substitutes, Feeding Bottles and Infant Foods Act, 1992 and Rules 1993 and Standards of Weights and Measures (Packaged Commodities) Rules 1977*

**6.2.2 BIS Certification Marking**

The product may also be marked with the Standard Mark.

**6.2.2.1** The use of the Standard Mark is governed by the provisions of the *Bureau of Indian Standards Act 1986* and the *Rules and Regulations made thereunder*. The details of conditions under which a licence for

the use of the Standard Mark may be granted to manufacturers or producers may be obtained from the Bureau of Indian Standards.

**6.2.2.2 ECO Mark**

The product may also be marked with the ECO-Mark, the details of which may be obtained from the Bureau of Indian Standards.

**7 SAMPLING**

Representative samples of the material shall be drawn and tested for conformity to this standard as prescribed in Annex E of IS 14433.

NOTE — The crude fibre content [Table 1, Sl No. (x)] shall be tested on the composite sample.

## ANNEX A

(Clause 2)

## LIST OF REFERRED INDIAN STANDARDS

IS No	Title	IS No	Title
1690 1995	Methods of sampling and test for food colours ( <i>second revision</i> )		<i>aureus</i> and faecal streptococci ( <i>first revision</i> )
2491 1998	Food hygiene – General principles Code of practice ( <i>second revision</i> )	(Part 3) 1999	General guidance on methods for the detection of <i>Salmonella</i> ( <i>second revision</i> )
2860 1964	Methods of sampling and test for processed fruits and vegetables	(Part 5) 1976	Isolation, identification and enumeration of vibrio cholerae and vibrio parahaemolyticus ( <i>first revision</i> )
4684 1975	Specification of edible groundnut flour (expeller pressed) ( <i>first revision</i> )	(Part 7) 1999	General guidance on methods for isolation and identification of <i>Shigella</i>
5398 1969	Method for estimation of thiamine (vitamin B <sub>1</sub> ) in foodstuffs		
5399 1969	Methods for estimation of riboflavin (vitamin B <sub>2</sub> ) in foodstuffs	7219 1973	Method for determination of proteins in food and feed ingredients
5400 1969	Methods for estimation of nicotinic acid (Niacin) in foodstuffs	7234 1974	Method for estimation of tolic acid in foodstuffs
5401 (Part 1) 2002	Microbiology – General guidance for the enumeration of coliforms Part 1 Colony count technique ( <i>first revision</i> )	10171 1999	Guide on suitability of plastics for food packaging ( <i>second revision</i> )
5402 2002	Microbiology – General guidance for the enumeration of micro-organisms—Colony count technique at 30°C ( <i>first revision</i> )	10226 (Part 1) 1982	Method for determination of crude fibre content Part I General method
5403 1999	Method for yeast and mould count of foodstuffs ( <i>first revision</i> )	10641 1983	Recommended methods for determination of aroma and taste thresholds
5835 1970	Method for estimation of vitamin D in foodstuffs	11078 1993	Round open top sanitary cans for milk powder ( <i>first revision</i> )
5838 1970	Method for estimation of vitamin C in foodstuffs	11124 1984	Method for atomic absorption spectrophotometric determination of arsenic
5886 1970	Methods for estimation of carotenes and vitamin A (Retinol) in foodstuffs	11623 1986	Method for determination of moisture content in milk powder and similar products
5887 (Part 1) 1976	Methods for detection of bacteria responsible for food poisoning Isolation, identification and enumeration of <i>Escherichia coli</i> ( <i>first revision</i> )	11721 2005	Dried milk and dried milk products – Determination of fat content Gravimetric method (Reference method) ( <i>first revision</i> )
(Part 2) 1976	Isolation, identification and enumeration of <i>Staphylococcus</i>	12074 1987	Method for determination of lead by atomic absorption spectro-photometry
		14433 2007	Infant milk substitutes – Specification ( <i>first revision</i> )

## ANNEX B

[Table 1, *Sl No. (iii)*]

### DETERMINATION OF FAT

#### B-1 APPARATUS

As prescribed in 6 of IS 11721

#### B-2 REAGENTS

As prescribed in 5 of IS 11721 and the reagents given in B-2.1 and B-2.2

##### B-2.1 Iodine Solution — 0.1 N

##### B-2.2 Diastase or Amylase

#### B-3 PROCEDURE

B-3.1 Weigh accurately about 1 g of the sample in a

Mojonnier fat extraction flask. After introducing the sample into the flask, add approximately 0.5 g diastase or amylase. Then add 8 to 10 ml distilled water (*see* IS 1070) at 45°C to facilitate suspension.

B-3.2 Place the stoppered extraction flask in the water bath for 2 h, shaking it from time-to-time taking care that the product does not stick to the walls of the flask. Check if the starch is digested. Add 2 drops of iodine solution. No blue colouration should appear. If required, place the flask again in water-bath till the digestion of the starch is complete. Proceed further as prescribed in 8.3 to 9.1 of IS 11721, excluding 8.5.1 of IS 11721.

## ANNEX C

[Table 1, *Sl No. (iv)*]

### DETERMINATION OF TOTAL CARBOHYDRATES

C-1 Total carbohydrates are calculated as follows after determining the percentage of moisture, total protein, fat and total ash

Total carbohydrates, including sucrose, dextrose and dextrans, maltose or lactose, percent by mass  

$$= 100 - (A + B + C + D)$$

where

$A$  = percent by mass of moisture,  
 $B$  = percent by mass of total protein,  
 $C$  = percent by mass of fat, and  
 $D$  = total ash, percent by mass

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This Indian Standard has been developed from Doc. No. I AD 19 (1722)

### Amendments Issued Since Publication

Amendment No.	Date of Issue	Text Affected

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