

CIRCULAR

ENERGY CONSUMPTION QUOTA IN THE BEER AND BEVERAGE PRODUCTION INDUSTRY

Pursuant to the Government's Decree No. 95/2012/ND-CP dated November 12, 2012, defining the functions, tasks, powers and organizational structure of the Ministry of Industry and Trade

Pursuant to the Law on Economical and Efficient Use of Energy dated June 28, 2010;

Pursuant to the Government's Decree No. 21/2011/ND-CP dated March 29, 2011 detailing the implementation of the Law on Economical and Efficient Use of Energy;

At the request of general director of General Directorate of Energy;

The Minister of Industry and Trade promulgates regulations on energy consumption norms for beer and beverage production industry as follows:

Chapter I

GENERAL PROVISIONS

Article 1. Governing scope

This Circular stipulates:

1. Energy consumption norms in beer and beverage production facilities in the period to the end of 2020 and the period from 2021 to the end of 2025.
2. Method for determination of specific energy consumption in beer and beverage production facilities.
3. This Circular is inapplicable to purified and mineral water products.

Article 2. Regulated entities

1. Facilities, organizations and/or individuals engaging in beer and beverage production industry.
2. Other relevant agencies, organizations, and individuals.

Article 3. Interpretation of terms

1. *Specific energy consumption (SEC)* refers to the total amount of energy consumed to produce a product unit.
2. *Energy consumption norms* refer to specific energy consumption index in proportion to each period stipulated by the Ministry of Industry and Trade *in this Circular*.
3. *One hectoliter (1 hl)* is a unit of capacity equal to 100 liters (100 l).

Chapter II

ENERGY CONSUMPTION NORMS AND MEASURES OF INCREASING EFFICIENCY IN ENERGY USE IN BEER AND BEVERAGE PRODUCTION INDUSTRY

Article 4. Determination of specific energy consumption

1. SEC in beer production industry shall be determined according to the method mentioned in Annex I.

2. SEC in beverage production industry shall be determined according to the method mentioned in Annex II.

Article 5. Energy consumption norms for beer and beverage production industry in the period to 2025

1. Period to the end of 2020:

No.	Industry		Norms (MJ/hl)
		<i>Capacity (million liters)</i>	
1	Beer	> 100	140
		20 - 100	215
		< 20	306
		<i>Type of production</i>	
2	Beverage	Fizzy or both fizzy and still	55
		Still	111

2. Period from 2021 to the end of 2025:

No.	Industry		Norms (MJ/hl)
		<i>Capacity (million liters)</i>	
1	Beer	> 100	129
		20 - 100	196
		< 20	286
		<i>Type of production</i>	
2	Beverage	Fizzy or both fizzy and still	52
		Still	107

Article 6. Requirements for energy consumption norms in the period to the end of 2025

1. SEC of beer and beverage production facilities (herein 'production facilities') in the period from now to 2025 shall not be allowed to be higher than energy consumption norms as prescribed in Clause 1 and Clause 2, Article 5 of this Circular.

2. In case SEC of production facilities is higher than energy consumption norms in proportion to each period, the production facilities shall establish and implement measures to increase efficiency in energy use to satisfy requirements as prescribed in Clause 1, Clause 2, Article 5 herein.

3. SEC of investment projects or projects on renovation and expansion shall not be allowed to be higher than energy consumption norms as prescribed in Clause 2, Article 5 herein.

Article 7. Measures to increase efficiency in energy use in beer and beverage production industry

1. Management measures:

- a. Increase management of activities of using energy in facilities;
- b. Construct and maintain energy management system in facilities.

2. Technical and technological measures include:

- a. Optimize technology process;
- b. Use energy efficient equipment;

3. Encourage organizations, individuals to take measures to increase efficiency in energy use as prescribed in Clause 1, Clause 2, Article 7 and Annex III (in case of beer production industry) or Annex IV (in case of beverage production industry) enclosed herein.

Chapter III

IMPLEMENTATION

Article 8. Responsibility of General Directorate of Energy

1. Preside over and cooperate with relevant agencies in instructing and organizing supervision, inspection of implementation of this Circular;
2. General Directorate of Energy shall cooperate with the Service of Industry and Trade across the country in inspecting the implementation of energy consumption norms, feasibility of the plans to ensure energy norms as scheduled (if need be).
3. Based on the results of inspection, General Directorate of Energy shall make the report to the Minister of Industry and Trade on cases of failing to comply with Article 5 herein and propose penalties according to applicable regulations.

Article 9. Responsibility of the Service of Industry and Trade

1. Cooperate with General Directorate of Energy in instructing and speeding up inspection of economical and efficient use of energy under this Circular.
2. Annually, preside over inspection of implementation of energy consumption norms, feasibility of the plans to ensure energy norms as scheduled for production facilities in localities.
3. Report the implementation of energy consumption norms for beer and beverage production industry in localities to General Directorate of Energy, the Ministry of Industry and Trade before January 31 annually as prescribed in Annex V enclosed herein.

Article 10. Responsibility of production facilities, relevant organizations and/or individuals

1. Organizations and/or individuals engaging in beer and beverage production industry shall have plans to meet requirements as prescribed in Article 5 herein.
2. Before January 15 annually, production facilities shall be responsible for reporting the implementation of energy consumption norms as prescribed in Annex VI enclosed herewith to the Ministry of Industry and Trade through the Service of Industry and Trade, General Directorate of Energy.
3. Production facilities that fail to meet energy consumption norms as prescribed and fail to propose feasible plans to ensure the norms as scheduled in Article 5 herein shall be subject to penalties according to applicable regulations.

Article 12. Effect

1. This Circular takes effect since November 01, 2016.
2. Any project that has had the investment policy decision issued by competent agencies after the effective date of this Circular shall meet provisions set out in Clause 2, Article 5 herein.
3. Difficulties that arise during the implementation of this Circular shall be reported to the Ministry of Industry and Trade for amendments./.

PP THE MINISTER
DEPUTY MINISTER

Hoang Quoc Vuong

ANNEX I

METHOD FOR DETERMINATION OF SPECIFIC ENERGY CONSUMPTION IN BEER PRODUCTION FACILITIES (Enclosed with the Minister of Industry and Trade's Circular No. 19/2016/TT-BCT dated September 14, 2016)

1. Scope of assessment: beer production areas (not including administrative areas and other production areas).
2. The time for determination of SEC (herein 'SEC determination time) in facilities shall be one year (from January 01 to December 31). If examination and verification of SEC is required, the time for doing so shall be equal to the time required for completion of a production cycle.
3. Parameters to determine SEC in beer production facilities:

Table 1.1 Data for determination of SEC in beer production facilities

Factors	Description	Unit
e1	Amount of electricity consumed in production areas during SEC determination time	kWh
e	Amount of electricity consumed throughout the facility (in case e1 cannot be determined) for facilities with production and administrative areas only (without other energy consumption areas)	kWh
t1	Amount of fuel consumed in production areas during SEC determination time	See below
t1 - coal	Amount of coal consumed in production areas during SEC determination time	Tonne and type
t1 (FO)	Amount of fuel oil consumed in production areas during SEC determination time	Tonne or 1,000L
t1 (Diesel)	Amount of diesel consumed in production areas during SEC determination time	Tonne or 1,000L
t1 (LPG)	Amount of LPG consumed in production areas during SEC determination time	Tonne
t1 (steam)	Amount of steam consumed (sought from outside sources) in production areas during SEC determination time	Tonne and pressure
t1 (other types of fuel)	Amount of other types of fuel (fire wood or biomass) consumed in production areas during SEC determination time Not including renewable energy (solar energy, biogas, wind energy...)	Tonne and type of fuel
p	Output of beer of all kinds during SEC determination time	hl
p1	Output of bottled beer during SEC determination time	hl
p2	Output of canned beer during SEC determination time	hl
p3	Output of draught beer during SEC determination time	hl

4. Equivalent product: equivalent product in beer production facilities are bottled beer products. Other beer products shall be converted to bottled beer products in order to calculate SEC.

5. SEC in beer production facilities shall be determined in Formula 1.1 as follows:

$$\text{SEC}_{\text{production facilities}} = \frac{E1}{P(e)} + \frac{T1}{P(t)} \quad [\text{MJ/hl}] \quad (\text{Formula 1.1})$$

Where:

- E1: Equivalent electrical energy consumed in production areas during the period of survey, MJ;
- T1: Equivalent thermal energy consumed in production areas during the period of survey, MJ;
- P (e): Output of equivalent product (electricity-based), hl;
- P (t): Output of equivalent product (heat-based), hl;

6. Determination of E1, T1, P(e) and P(t):

a) Determination of electrical energy E1

Electrical energy consumed in production areas (e1) during the period of survey shall be converted to unit of measurement (MJ) as follows:

$$E1 = e1 \times 3.6 \quad [\text{MJ}] \quad (\text{Formula 1.2})$$

Where:

- E1: Equivalent electrical energy consumed in production areas during the period of survey (MJ);
- e1: Amount of electricity consumed in production areas during the period of survey (MJ);
- 3.6 (MJ/kWh): conversion factor.

If beer production facilities do not have figures e1, transport activities, canteens and produce beer only, e1 shall be calculated according to the amount of electricity consumed throughout the facility e as follows:

$$e1 = 0.95 \times e \quad [\text{kWh}] \quad (\text{Formula 1.3})$$

Where:

- e1: Equivalent electrical energy consumed in production areas during the period of survey (kWh);
- e: Electrical energy consumed throughout the facility during the period of survey (kWh);
- 0.95: conversion factor

b) Determination of thermal energy T1

Thermal energy consumed in production areas (T1) during the period of survey shall be converted to unit of measurement (MJ) as follows:

$$T1 = \sum t1(\text{fuel } i) \times k(\text{fuel } i) \quad [\text{MJ}] \quad (\text{Formula 1.4})$$

Where:

- T1: Amount of equivalent thermal energy consumed in production areas during the period of survey (MJ);
- t1 (fuel i): amount of fuel consumed in production areas during the period of survey;
- k (fuel i): conversion factor as prescribed in Table 1.2.

Table 1.2 Conversion factor k (fuel i)

Fuel	Type	Unit	Conversion factor, MJ/unit
t1 (coal)	Coal dust 1.2	Tonne	29.309
	Coal dust 3.4	Tonne	25.122
	Coal dust 5.6	Tonne	20.935
t1 (DO)	DO	Tonne	42.707
		1,000L	36.846
t1 (FO)	FO	Tonne	41.451
		1,000L	39.358
t1 (LPG)	LPG	Tonne	45.638
t1 (steam)	Steam (absolute pressure 6 bar)	Tonne	3.674
	Steam (absolute pressure 7 bar)	Tonne	3.681
	Steam (absolute pressure 8 bar)	Tonne	3.690
	Steam (absolute pressure 9 bar)	Tonne	3.696
t1 (other types of fuel)	Firewood/rice hulls/biogas	Tonne	15.600
	Other types of biogas	Tonne	11.600

c) Determination of output of equivalent product P(e) and P(t)

Output of equivalent product P(e) is calculated as follows:

$$P(e) = p1 + p2 \times 0.72 + p3 \times 0.91 \quad [\text{hl}] \quad (\text{Formula 1.5})$$

Where:

- P(e): Output of equivalent product (for electrical energy) during the period of survey (hl)
- p1: Output of bottled beer during the period of survey (hl);
- p2: Output of canned beer during the period of survey (hl);
- p3: Output of draught beer during the period of survey (hl);
- 0.72: Conversion factor (for electrical energy) from canned beer to bottle beer;
- 0.91: Conversion factor (for electrical energy) from draught beer to bottle beer;

Output of equivalent product P(t) is calculated as follows:

$$P(t) = p1 + p2 \times 0.59 + p3 \times 0.88 \quad [\text{hl}] \quad (\text{Formula 1.6})$$

Where:

- P(t): Output of equivalent product (for thermal energy) during the period of survey (hl);
- p1: Output of bottled beer during the period of survey (hl);
- p2: Output of canned beer during the period of survey (hl);
- p3: Output of draught beer during the period of survey (hl);
- 0.59: Conversion factor (for thermal energy) from canned beer to bottle beer;
- 0.88: Conversion factor (for thermal energy) from draught beer to bottle beer;

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ANNEX II

METHOD FOR DETERMINATION OF SPECIFIC ENERGY CONSUMPTION IN BEVERAGE PRODUCTION FACILITIES *(Enclosed with the Minister of Industry and Trade's Circular No. 19/2016/TT-BCT dated September 14, 2016)*

1. Scope of assessment: beverage production areas (not including administrative areas and other production areas).
2. The time for determination of SEC in facilities shall be one year (from January 01 to December 31). If examination and verification of SEC is required, the time for doing so shall be equal to the time required for completion of a production cycle.
3. Parameters to determine SEC in beverage production facilities:

Table 2 Data for determination of SEC in beverage production facilities

<i>Parameter</i>	<i>Description</i>	<i>Unit</i>
e1	Amount of electricity consumed in production areas during SEC determination time	kWh
e	Amount of electricity consumed throughout the facility (in case e1 cannot be determined) for facilities with production and administrative areas only (without other energy consumption areas)	kWh
t1	Amount of fuel consumed in production areas during SEC determination time	See below
t1 - coal	Amount of coal consumed in production areas during SEC determination time	Tonne and type
t1 (FO)	Amount of FO consumed in production areas during SEC determination time	Tonne or 1,000 liters
t1 (Diesel oil)	Amount of diesel oil consumed in production areas during SEC determination time	Tonne or 1,000 liters
t1 (LPG)	Amount of LPG consumed in production areas during SEC determination time	Tonne
t1 (steam)	Amount of steam consumed (sought from outside sources) in production areas during SEC determination time	Tonnes and pressure
t1 (other types of fuel)	Amount of other types of fuel (fire wood or biomass) consumed in production areas during SEC determination time Not including renewable energy (solar energy, biogas, wind energy...)	Tonne and type
p	Output of beverage of all kinds during SEC determination time	hl
p1	Output of fizzy beverage during SEC determination time	hl
p2	Output of still beverage during SEC determination time	hl
p3	Output of beverage contained in glass bottles during SEC determination time	hl
p4	Output of beverage contained in glass bottles during SEC determination time	hl
p5	Output of canned beverage during SEC determination time	hl
p6	Output of packaged beverage during SEC determination time	hl

4. Equivalent products: Equivalent products from beverage production facilities refers to the beverage contained in disposable bottles. Bottled fizzy beverage products shall be selected for conversion in case the facility produces both fizzy and still beverage.
5. SEC in beverage production facilities shall be determined in Formula 2.1 as follows:

$$\text{SEC production facilities} = \frac{E1}{P(e)} + \frac{T1}{P(t)} \quad [\text{MJ/hl}] \quad (\text{Formula 2.1})$$

Where:

- E1: Equivalent electrical energy consumed in production areas during the period of survey (MJ);
- T1: Equivalent thermal energy consumed in production areas during the period of survey (MJ);
- P (e): Output of equivalent product (electrical energy), hl;
- P (t): Output of equivalent product (thermal energy), hl;

6. Determination of E1, T1, P(e) and P(t):

a) Determination of electrical energy E1

E1 shall be calculated according to Formula 1.2 and 1.3 in Annex I.

b) Determination of thermal energy T1

T1 shall be calculated according to Formula 1.4 in Annex I.

c) Determination of output of equivalent product P(e), P(t)

If the facility produces either fizzy product or still product:

Output of equivalent product P(e) is calculated as follows:

$$P(e) = p3 + p4 + p5 \times 0.99 + p6 \quad [\text{hl}] \quad (\text{Formula 2.2})$$

Where:

- P(e): Output of equivalent product (thermal energy) during the period of survey (hl);
- p3: Output of bottled soft drinks (disposable bottles) during the period of survey (hl);
- p4: Output of bottled soft drinks (glass bottles) during the period of survey (hl);
- p5: Output of canned beverage during the period of survey (hl);
- p6: Output of packaged soft drinks during the period of survey (hl);
- 0.99: Conversion factor (electrical energy) from canning to bottling (disposable bottles).

Output of equivalent product P(t) is calculated as follows:

$$P(t) = p3 + p4 \times 3.89 + p5 + p6 \quad [\text{hl}] \quad (\text{Formula 2.3})$$

Where:

- P(t): Output of equivalent products (thermal energy) during the period of survey (hl);
- p3: Output of bottled soft drinks (disposable bottles) during the period of survey (hl);
- p4: Output of bottled soft drinks (glass bottles) during the period (hl);
- p5: Output of canned soft drinks during the period of survey (hl);
- p6: Output of packaged beverage during the period of survey (hl);
- 3.89: Conversion factor (thermal energy) from glass bottles to disposable bottles.

If the facility produces both fizzy product and still product:

Output of equivalent products P(e) is calculated as follows:

$$P(e) = 0.5 \times (p1 + p2 \times 1.31 + p3 + p4 + p5 \times 0.99 + p6) \quad [\text{hl}] \quad (\text{Formula 2.4})$$

Where:

- P(e): Output of equivalent products (electrical energy) during the period of survey (hl);
- p1: Output of fizzy beverage during the period of survey;
- p2: Output of still beverage during the period of survey;
- p3: Output of bottled soft drinks (disposable bottles) during the period (hl);
- p4: Output of bottled soft drinks (glass bottles) during the period (hl);
- p5: Output of canned soft drinks during the period of survey (hl);

- p6: Output of packaged soft drinks during the period of survey (hl);
- 1.31: Conversion factor (electrical energy) from still soft drinks to fizzy beverage;
- 0.99: Conversion factor from canned soft drinks to bottled soft drinks (disposable bottles).

Output of equivalent product P(t) is calculated as follows:

$$P(t) = 0.5x \times (p1 + p2 \times 0.96 + p3 + p4 \times 3.89 + p5 + p6) \quad [\text{hl}] \quad (\text{Formula 2.5})$$

Where:

- P(t): Output of equivalent product (thermal energy) during the period of survey (hl);
- p1: Output of fizzy beverage during the period of survey;
- p2: Output of still beverage during the period of survey;
- p3: Output of bottled soft drinks (disposable bottles) during the period of survey (hl);
- p4: Output of bottled soft drinks (glass bottles) during the period of survey (hl);
- p5: Output of canned soft drinks during the period of survey (hl);
- p6: Output of packaged soft drinks during the period of survey (hl);
- 0.96: Conversion factor (thermal energy) from still soft drinks to fizzy beverage;
- 3.89: Conversion factor (thermal energy) from bottled soft drinks (glass bottles) to bottled soft drinks (disposable bottles).

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ANNEX III

A NUMBER OF ENERGY SAVING MEASURES IN BEER PRODUCTION INDUSTRY (*Enclosed with the Ministry of Industry and Trade's Circular No. 19/2016/TT-BCT dated September 14, 2016*)

1. Install insulation for steam piping and refrigeration piping.
2. Purchase steam from outside service companies.
3. Save energy with high-performance lights.
4. Use inverters and electricity-saving measures.
5. Optimize wort cooling process (from one-step process into two-step process).
6. Use stratified cooling system.
7. Use compressed natural gas (CNG), rice hulls, compressed wood blocks, compressed rice hulls as fuel for boilers in place of DO.
8. Use industrial heat pumps to provide hot water for pasteurization.
9. Recover heat from hops cooking
10. Control/utilize excess gas from boilers
11. Install steam compressors for boilers.
12. Recover weak wort
13. Use biogas from wastewater treatment plants to operate electricity generators or stoke boilers.
14. Typical measure for facilities below 20 million liters in capacity:
 - a) Install pressure tanks for air compressors
 - b) Replace old filling systems.

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ANNEX IV

A NUMBER OF ENERGY SAVING MEASURES IN BEVERAGE PRODUCTION INDUSTRY
(Enclosed with the Ministry of Industry and Trade's Circular No. 19/2016/TT-BCT dated September 14, 2016)

I. A number of typical energy saving measures for fizzy beverage production:

1. Adjust operation of syrup cooling system.
2. Install heat recovery from boilers
3. Optimize operation of air compressing system.
4. Replace old filling systems.
5. Replace boilers
6. Innovate lighting system
7. Recover condensate
8. Install insulation for steam piping.
9. Use inverters and electricity-saving measures.
10. Use industrial heat pumps to provide hot water for production, CIP.
11. Use stratified cooling system.
12. Replace reciprocating ammonia compressors with high-performance screw compressors.

II. A number of typical energy saving measures for still beverage production:

1. Recover condensate
2. Innovate lighting system
3. Repair and replace steam traps
4. Recover excess gas from boilers
5. Install insulation for steam piping.
6. Use inverters and electricity-saving measures.
7. Install exhaust-fired water heating equipment

ANNEX V

SPECIMEN REPORT ON IMPLEMENTATION OF ENERGY CONSUMPTION NORMS IN BEER AND BEVERAGE PRODUCTION INDUSTRY (Enclosed with the Ministry of Industry and Trade's Circular No. 19/2016/TT-BCT)

REPORT ON IMPLEMENTATION OF ENERGY CONSUMPTION NORMS IN BEER AND BEVERAGE PRODUCTION INDUSTRY IN THE YEAR 20 ...

Respectfully addressed to: General Directorate of Energy, the Ministry of Industry and Trade

In the implementation of the Ministry of Industry and Trade's Circular No. .../.../TT-BCT dated ... stipulating implementation of energy consumption norms in beer and beverage production industry, the Service of Industry and Trade reports the implementation of energy consumption norms in beer and beverage production industry in the administrative division as follows:

I. Implementation of energy consumption norms in beer production industry:

- Number of facilities that have made reports:

- Number of facilities failing to make reports:

No.	Name of facilities
1	
2	
3	
...	

- Number of facilities failing to meet energy consumption norms:

No.	Name of facilities	SEC (MJ/tonne)	Measures to increase efficiency in energy use and implementation period
1			
2			
3			
...			

II. Implementation of energy consumption norm in beverage production industry:

- Number of facilities that have made reports:

- Number of facilities failing to make reports:

No.	Name of facilities
1	
2	
3	
...	

- Number of facilities failing to meet energy consumption norms:

No.	Name of facilities	SEC (MJ/tonne)	Measures to increase efficiency in energy use and implementation period
1			
2			
3			
...			

Report date ...

Head of agency, unit (Signature, full name)

and stamp)

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ANNEX VI

SPECIMEN REPORT ON IMPLEMENTATION OF ENERGY CONSUMPTION NORMS IN BEER AND BEVERAGE PRODUCTION INDUSTRY (Enclosed with the Ministry of Industry and Trade's Circular No. 19/2016/TT-BCT)

REPORTS ON IMPLEMENTATION OF ENERGY CONSUMPTION NORMS IN THE YEAR 20 ...

Respectfully addressed to: The Service of Industry and Trade of province/city ...

[Name of facility] making the report	Report date ...
Date of receipt of report	[This space is intended for the Service of Industry and Trade's comments]
Date of settlement and confirmation	[This space is intended for the Service of Industry and Trade's comments]

Industry classification: ...

Name of facility:

Address:[Name of district ...] [Name of province ...]

Phone number:Facsimile:....., Email:

Affiliated to (Name of parent company):

Address:[Name of district ...] [Name of province ...]

Phone number:Facsimile:Email:

Owner: (State/other economic sectors)

I. Information about facility and product

Year of operation	
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Production capacity

(Select unit of measurement as tonne/year; m/year; m²/year; m³/hour ... to suit types of products)

Production capacity / Name of product	Unit of measurement	Design output	Annually reported output
.....			

Current energy-consumption rates

Type of fuel	Quantity	Unit	Purposes
Electricity		kWh	
Coal		Tonne	
Fuel oil		Tonne	
Diesel oil		Tonne	
Petroleum		Tonne	
Gas		M ³	
Coke		Tonne	
Coal gas		m ³	
Steam sought from outside service companies		Tonne	
...			

II. Implementation of energy consumption norms in the year 20 ...

a) Specific energy consumption (SEC) (*Calculated according to Formula 1.1 in Annex I, or Formula 2.1 in Annex II depending on industry*).

b) Ratio of improved energy consumption productivity compared with previous year: $(= [(SEC_{previous\ year} - SEC_{present}) / SEC_{previous\ year}] \times 100\%)$.

III. Reports on formulation of plan and measures to increase efficiency in energy use to meet energy consumption norms during present period (If any)

a) Propose measures and implementation plans to meet energy consumption norms

b) SEC expected for the next year

c) Determine the time to meet energy consumption norms according to the implementation plan and measures proposed by the facility.

Reported by (*Signature and full name*)

Director of the unit (*Signature, full name and stamp*)

Report date ...

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