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REVIEW OF CURRENT METHODS AND PRACTICES USED BY EGYPT FOR CONDUCTING INDUSTRIAL FEASIBILITY STUDIES[1/]

by

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C O N T E N T S

I. The Purpose of The Expert Group Meeting:

The purpose of the expert group meeting on technical assistance in pre-investment studies, is:

(1) To conduct an in - depth review of the difficulties encountered by developing countries in generating and maintaining constant flow of bankable industrial projects.

(2) To formulate recommendations for developing and strengthening the capacity of developing countries in organizing and following , on pre-investment studies.

2. The Process of Industrialization in Developing Countries:

The process of industrialization in most Independent Developing Countries, gaining their full political independence, during the third quarter of the current century 1950 - 1975 has been occupied leading position in their socio-economic development plans and programs.

These countries are trying to apply the historically proven lesson that to win the battle against techno-economic backwardness, the pattern of their economies should be restructured through the utilization of modern industrial production technologies.

To most of these developing countries, and Egypt is amongst them, industrialization is a process of economic development in which a growing part of the national resources is mobilised to develop a technically up-to-date, diversified, domestic economic structure characterised by a dynamic manufacturing sector having and producing means of production and consumer goods, and capable of assuring a high rate of growth for the economy as a whole and of achieving economic and social progress". The above stated scope of the process of industrialization is derived from the accepted definition of the UN Committee for Industrial Development taken up in its third session in 1963. Egypt, as many other developing countries, looks on industrialization as an economic development process forming a leading position in their economic and social plans.

Accordingly, whilst such a process consists, mainly of a cluster of industrial projects, it represents a sector of an integrated developing economic structure.

This concept is of relevant importance to the subject of difficulties encountered in generating and maintaining constant flow of bankable industrial projects. More detailed implications of the matter will be considered in this paper.

3. Stages Of Life History of An Industrial Project:

Since the central target of the Experts Meeting is concerned with feasibility studies of industrial projects, it is considered of importance to define the "Life History" of an industrial project, as consisting of four different consecutive and complementary stages namely:-

(1) The feasibility stage.
(2) Design and Engineering Stage.
(3) Implementation or Construction Stage.
(4) Operation - or production - and maintainance stage.

The feasibility stage entails, as a forerunner of other stages, basic information and studies of initial techno-economic parameters connected with identification of project or projects and its priorities within an industrial program or within industrial subsector group of projects. Issues of cost and benefit analysis of the sizable industrial project are closely interwoven in the fabric of allocation of resources, investment criteria, candidate technology or technologies for project under study, and the dynamic interaction, between the project as a micro-economic entity, and the national, regional- and sometimes international- macro economic systems, affected by and affecting the project.

Main Aspects of Feasibility Studies of Industrial Project:

The feasibility study of an industrial project is in essence a feasibility appraisal of the project entailing an act of investigation, analysing judgement of the worth and potententiality of a proposed scheme -project- to assess the possibilities of its realisation and the results of its execution. The main aspects of study are arranged in a logical system of priorities according to their appearance on the study "platform":-

(1) The industrial Marketing aspects.

(2) The Technical and Technological aspects.

(3) The Socio-Economic Aspects.

(4) The Organizational aspects.

(5) The Managerial Aspects.

(6) The Financial capital investment aspects.

These different and interrelated aspects vary considerably according to types of projects involved: Each of them has its quantitative and qualitative descriptor & in a distinctive manner, but all in some way or another are functions of future time i.e. in the temporal period of a limited span of active life of the project... These features represent some of the main sources of difficulties encountered in establishing feasibility studies of industrial projects, since in fast changing era as our present era is, prediction & forecast for the near future, to say little about the far future, are liable to wide deviations from future actual circumstances.

5. Investment Criteria of Feasible Industrial Projects:

The prevailing economic conditions of most developing countries (agriculture based backward economy, existance of massive unemployment, scarcity of capital, low level of savings, shortage of foreign exchange) and the failure of a price system leading to optimum investment allocation lead to investment criteria other than private profitability.

During recent years many investment criteria have been proposed, evolved and applied. The principal investment criteria used for evaluating the preference of investment in developing countries are as follows:-

(1) The product capital ratio criterion/minimum capital output ratio.

(2) The employment per unit of capital criterion.
(3) The Social Marginal productivity criterion.
(4) The Marginal reinvestment criterion.
(5) The Marginal growth contribution criterion.
(6) The foreign exchange benefits criterion.
(7) The benefits-cost ratio criterion.

It is beyond the scope of the present review, to explain or recommend the use of certain criteria for selection of industrial projects as exhibited in their feasibility studies. The aim of citing these investment criteria is to illustrate one source of difficulties encountered in judging or evaluating industrial projects in developing countries, since the analysis leading to judgement is dependent on the selected guiding criterion or criteria.

6. Limitations and Validities of Feasibility studies of Industrial Projects:

Whilst feasibility studies of industrial projects (investment, projects) are indispensible potent tools for decision taking concerned with investment in such projects, they have their limitations, tolerence of error and approximations. Any such study is an event within a special four dimensional contin um, to borrow an analogy from relativistic physics. These dimensions are:-

nature, machines, human society and flowing future time. Such limitations and degree of errors should be constantly reckoned with, when evaluating feasibility studies. And thus the element of "risk" in all future economic activities studied foreseen within an estimated set of special, material, human and temporal parameters, is inherent. These limitations and tolerence of error encompass validity of feasibility studies of industrial projects, which varies from country to country and from case to case.

7. Current Methods and Practices Used By Egypt for Conducting Feasibility Studies of Public Sector Industrial Projects:

7.1 Capital Investment Profile of The Egyptian Economy For The Periods 1965/1966 - 1969/1970 and 1970/1975:

Values of capital investments, in the Egyptian Economy For The Five Years Period 1965/1966-1969/1970 and The Five and a half years 1970/1971-1975 are as follows:

Table (1)

Values in current prices (Million U.S.$) at official rate of exchange (1 LE = 2-5 US $).

Item	Period 65/66-69/70	Period 70/71-75	Total 65/66-75	Annual average of the periods	
1. National investment of which : (fixed capital formation).	4280	7930	12210	1163	31.3%
Industrial inv.	1272.5	2550	3822.5	364	
2. National Production of which :	58457.5	93250	151707.5	14448	40.9%
Industrial production	24662.5	37425	62087.5	5913	
3. Gross value added	28405	41500	69905	6658	21.0%
of which :					
Industrial Gross value added.	6112.5	8562.5	14675	1398	

The average annual rate of industrial investment, during the period 1965/1966 - 1975 is about 364 Million US $, whilst the corresponding average industrial gross value added is about 1398 Million US $. These figures cover both public and private sectors, and both extractive and manufacturing, including petroleum.

7.2 The Structure of The Egyptian Industrial Sector (Mining & Manufacturing):

The Egyptian industrial sector on the national scale consists of three main sectors namely:- public sector, private sector, and joint venture sector. The public sector consists of two major sub-sectors namely:- That of the Ministry of Industry and Mineral Wealth, and that of other Ministries and Government Authorities (e.g. Suez Canal Authority).

Since in the present review, we shall limit ourselves to current methods and practices used by The Ministry of Industry and Mineral Wealth (MIMW) for conducting industrial feasibility studies, the relative weight of MIMW is depecited in the following table for 1975:

Table (2)

Values in Million US Dollars, current prices:-

Items	National Industrial Sector	MIMW Industrial Sub-Sector	Percentage (3) : (2)
(1)	(2)	(3)	(4)
1.Value of investment(fixed capital formation).	760	625	82
2.Value of production.	8250	3845	46
3.Value of Gross value added	2175	1180	54
4.Value of industrial exports	580	380	65
5.No.of employees (Millions)	1.22	0.526	43
6.Value of Wages	843	535	63

Accordingly, the major portion of industrial feasibility studies comes under the jurisdiction of that Ministry. Aspects relating to preparation evaluation and decision taking on projects subject of such studies, are part of the functions of the Ministry specialised organizations, namely:-

The main organs are the following:

(1) The General Organization for Industrialization (GOFI).
(2) The Egyptian Organization for Standard Specifications, (and Quality Control).
(3) The Administration of Industrial Control.
(4) The Administration of Trainning and Labour Productivity.
(5) The Egyptian General Organization for Geological Survey and Mining Projects.

7.3 Functions of The General Organization For Industrialization of The Ministry of Industry and Mineral Wealth:

The Ministry of Industry and Mineral Wealth was established as an independent specialised Ministry in July 1956, prior to that date, it was part of the Ministry of Trade and Industry. The Ministry formed the General Organization for The Execution of The Five Years Program in December 1957. In December 1964, the name of that Organization was changed to the General Organization for Industrialization and was charged with new functions, to cope with a new economic phase resulting from the nationalization of major industries in July 1961 and September 1964 and the emergence of a leading industrial sector controlled by six specialised Organizations, acting as holding companies, for different companies, formed in December 1961. As from 1964 the main functions of GOFI have been carried out by more than one thousand employees engineers, scientists, economists legal experts and supporting staff with an annual investment budget of studies and technical research of about 4 Million US $.

The main functionsof the Organization are:

1. Collecting data concerning industrial production and assistance in the dissemination of information on technical and technological innvations and know how.
2. Identification of investment opportunities based on available local and natural resources.
3. Carrying out pre-investment and feasibility studies of industrial projects, for public sector mainly-and private sector.
4. Examine the most efficient utilization of new and existing industrial capacities and assistance in solving technical and technological problems.
5. Formulation of industrial development plans and defining industrialization policies, to serve the public and private Egyptians sectors, as well as Joint Venture sectors, within the frame of the National Economic and Social Development Plans.
6. Participation in negotiating and concluding agreements on technical and economic co-operation and obtaining external financing for industrial development with International Organizations, Foreign Governments, and Private enterprises.
7. Participation, with concerned companies, in the conclusion of contracts for delivery of machinery, equipment, accessories and spares required for the establishment, renewal or expansion of industrial projects to ensure the most favourable contract terms.
8. Follow up of implementation of projects.

9. Examining applications submitted to the Ministry of Industry for obtaining licenses for establishing or expanding Egyptian industrial private enterprises. GOFI'S recommendation are given in the light of certain considerations of the internal economic situation and the needs of local consumption and exports.

10. Studying applications submitted by Arab and Foreign investors to the General Authority for Arab and Foreign Investment and Free Zones and giving recommendations as regards the viability of the proposed industrial projects.

11. Coordinate Egyptian Industrial Development Plans with Arab and African Development Plans.

12. Cooperate with UN, Government and Private Organizations and firms, working in the field of planning, studies, technical assistance, transfer of technology, related to industrial development.

7.4 Examples of Methods and Practices used by GOFI For Conducting Industrial Feasibility Studies:

Examples of methods and practices used by GOFI for conducting industrial feasibility studies are given below:

7.4.1 Feasibility Studies Conducted by GOFI:

Based on the accumalated experience of GOFI resulting from its active function in the field of modern Egyptian industrialization programs, during 19 years (1958 - 1976), having a total investment

for fixed capital formation, in the industrial public sector of The Ministry of Industry and Mineral Wealth, of more than six billion (six thousand Million) U.S. $, GOFI conducts on its own, feasibility studies for many of new industrial projects. Particularly those belonging to food, textile (Cotton) and building materials industries.

7.4.2 Feasibility Studies Conducted by Consultants:

Where World Bank, Arab Funds and similar international Organizations are involved in financing certain projects, then feasibility studies are conducted by a reputed specialised consultant or consulting firm, selected from a list of pre-qualified consultants approved by both concerned parties and awarded the necessary contract through limited call of tenders. Similar action is taken for Joint Venture projects.

7.4.3 Studies of Selected Egyptian Industrial Sectors:

A new approach of studies has been introduced in Egypt in the field of planned industrial development namely that emerging from studies of selected industrial sectors. On the initiative of H.E. Engineer ISSA SHAHIN, Minister of Industry and Mineral Wealth, an agreement was concluded with the World Bank of Reconstruction and Development, to extend a loan of one Million U.S $, to finance, during 1976, seven studies in the following industrial sub-sectors:-

(On the national scale)-
Food industries, textile industries, fertilizer, pulp and paper, building materials industries, metallurgical industries, engineering and electronic industries.

The objective of these studies is to prepare programmes and policies that will guide development in these elected industrial sub-sectors during the period 1976-1985. These programmes will identify projects which have been properly evaluated and are of high priority for execution during the first five year period 1976 - 1980.

The study for the metallurgical industries sub-sector entails the following titles of subjects to be covered, in the three phases of the study:

Phase 1: Data Collection:

Market demand, Macro-economic analysis, Basic costs and prices, Infrastructure and industrial zones, National Planning and its financial Criteria, commercial issues.

Phase 2: Identification of Projects:

Market forecasts, process and production techniques, plants' capacities, licensing arrangements, transport and plants' sites, pricing and tarrifs, capital and operating costs, manning requirements and social infrastructure, National Economic effects.

Phase 3: Definition of Projects:

The objectives of this phase are:-

a) To provide more detailed assessment of those projects identified in phase 2.

b) To construct on the basis of the three phases of the study on coherent development strategy for the expansion of metallurgical industries in Egypt.

c) To prepare medium and long term plans up to year 1985 and to year 2000 (indicative).

8. The Egyptian Mining Design Office:

The great increase in volume of investment in Egypt in the forthcoming years, calls for suitable investment services to enable design and execution of several projects.

Steady rise of raw material prices on the world market gives a new light on our natural resources exploitation, to fullfil the home-market demand as well as for considerable and profitable export.

The exploitation of discovered mineral deposits makes it necessary to prepare wide studies and designs.

For these purposes the Egyptian Geological Survey & Mining Authority has concluded a contract with Glowne Biuro Studiow Projektow Gorniczych-Katowice Poland (Chief Mining Study and Design Office) - to establish the Mining Design Office in the Authority.

The Mining Design Office being now in starting-up will be able to carry out the technical documentation for the country's mining investments program and in consequence will reduce the designing work carried out abroad. The mining design office personnel consists of Egyptian engineers, supported by a number of Polish experts.

8.1 The Scope of Work:

1. Preparing the Prefeasibility Studies:

Studies of geological documentation for alternative solutions of general mining areas or mines-conception. In general it contains the methods of dressing and beneficiations, general layout, water and power supply and transportation problems as well as the economical part which opens the way towards the proper choice for investment decisions.

2. Elaborating the Feasibility Reports:

Which are carried out for the chosen solution after the investment decision is taken.

The feasibility report concerns mainly the technical in each branch and defines accurately the estimated whole investment costs as well as all technical and economical indices.

3. Designing of the Detailed Engineering Projects:

These projects contain detailed engineering solutions as a whole design of each plant, arrangment, structures ... etc., and are the basement for carrying out construction work and technological installations.

4 - Elaborating the technical and implementing design work for individual elements in the mines located both underground and on the surface namely:

8.2 Underground:

- Methods of exploitation of deposit.
- Deposit development and exploitation systems.
- Underground haulage systems.
- Mine ventilation systems.
- Mine water drainage systems.
- Other objectives and underground equipment.
- Hoisting systems.

8.3 On the Surface:

- Headframe, shaft top, crushing plant.
- Technical solutions of transportation (railway, road, conveyors).
- Power, pumping and ventilation stations.
- Tanks, reservoirs, water supply.
- Auxiliary buildings as workshops, stores, administrative and social buildings ... etc.

8.4 The Investment Program:

According to the available basic data, the design office prepared tentative time schedule for execution of individual mining projects, including each period of designing, constructing, starting-up and developing of production.

The time-schedule comprises the following mining investments:

- Abu Tartur Phosphate mine.
- Lead & Zinc mine.
- Mahamid East Phosphate mine.
- Abu Sheigila Phosphate Mine.
- El Igla, tin mine.
- Um Higlig quartz mine.
- Limestone quarry.
- Reconstruction of talc mines.

The mining design office will work out the detailed engineering designs and supervise the work in course of construction for the mining projects.

9. Methods For Generating and Maintaining a Constant Flow of Bankable Industrial Projects:

Point (2) of this review, subscribes to the definition of the process of Industrialization in Developing countries, as being a process of economic development aiming at creating an up-to-date diversified domestic economic structure, through planned mobilization of national resources. In most developing countries, such planned mobilization is conducted by the central national governments through specialised agencies or departments which come under the administrative responsibility of either the Ministry of Industry or the Ministry of Planning, where such ministries exist. Such agencies or departments are held responsible for the preparation of feasibility studies for bankable industrial projects, either by their own staff, or by contracting with consulting engineering firms, or industrial consultant

to conduct the required studies. Accordingly, it can be concluded that the most efficient methods for generating and maintaining a constant flow of bankable industrial projects, is to establish or strengthen existing - specialised national agencies or departments having the function of industrializing their our countries. All kinds of technical assistance - bilateral and multiloteral- enhancing national consulting engineering services concerned with preparation, evaluation and follow-up of feasibility studies are needed, Unido assistance in this respect, to developing countries is of paramount importance.

Ministry of Industry & Mineral Wealth

The General Organization
For Industrialization
(GOFI)

List
of Major New Industrial & Mining Projects in the Five Years Plan 1976-80 and status of its Techno-Economic Feasibility Studies

Q= Quantity in thousand metric tons.
V= Values in Million L.E.

1. New Public sector Projects in the Plan

Project	Site	Investment		Annual Prod.		Who prepared Feasibility Study.
		Total	Foreign Component	Q.	V.	
(1)	(2)	(3)	(4)	(5)	(6)	(7)
1. Food Industries Projects						
1. Sugar Prod. and Refining	BALIANA (Upper Egypt)	30	10	100	15	GOFI & Sugar Co. (1975)
2. Second Line of Paper Pulp	EDFU (Upper Egypt)	20	12	44	14	GOFI & Sugar Co. (1975)
Sub-Total		50	22		29	

2. Textile Industries Projects						
3. Rehabilitation of Textile Industry	MEHALLA EL KOBRA	55	38		30	U.S.AID (1976)
4. Increase Prod. of Textile Industry.	KAFR EL DAWAR	34	24		25	I B R D (1975)
5. Increase Prod. of Textile Industry	KAFR EL DAWAR	19	10		15	I B R D (1976)
Sub-Total		108	72		70	
3. Chemical Industries Projects						
6. Doubling Sodium Carbonate Prod.	ALEX.	16	12	100	9	GOFI & MISR Chemical Co. (1975)
7. Flat Transparent Sheet Glass	KOSTOROD (CAIRO)	17	13	60	9	British Pelkington Co. (1975)
Sub-Total		33	25		18	
4. Metallurgical Industries Projects						
8. Sponge Iron (Metallized Iron)	SADAT CITY OR EL DEKHELA	51	36	800	40	GOFI & German BATELLE Institute (1973)
9. Steel Wire Rod Mill	SADAT CITY OR EL DEKHELA	44	25	400	52	GOFI (1975)
10. R/C Bar Mill	SADAT CITY OR EL DEKHELA	40	25	400	48	GOFI (1976)
11. Medium & Light Steel Castings	KOSTOROD (CAIRO)	16	9	10	5	GOFI & Delta Steel Co.
12. Electro Tinning of steel Sheet	HELWAN (CAIRO)	16	11	50	17	GOFI & Iron & Steel Co
13. Rolling of Zinc & Aluminum	HELWAN (CAIRO)	16	11	15	10	GOFI & General Metals Co.
Sub-Total		183	117		172	

5. Engineering Industries Projects							
14. Passengers Railway Wagons	HELWAN (CAIRO)	10	5	1500 WAGONS	15	GOFI & SEMAF Co. (1976)
6. Mining Industries Projects							
15. Phosphate Rock Concentration	ABU SHEIGELA (Red Sea)	20	12	600	9	GOFI & EL NASR PHOSPHATE CO. (1976)
16. Phosphate Rock Concentration	**ABU TARTUR (Western Desert)**	**362**	**120**	**6500**	**102**	**GOFI & +SOVIET NEFTICHIM (1975) +FRENCH SOFREMIN +SWISS ALUSUISSE (1977) (Under Preparation)**
Sub Total		**382**	**132**		**111**	
Grand Total (I)		**766**	**373**		**415**	

II. NEW JOINT VENTURE PROJECTS IN THE PLAN (1)

(1)	(2)	(3)	(4)	(5)	(6)	(7)
1. Food Industries Projects						
1. Agro-Industrial Complex of Beet Root Sugar Production	KAFR EL SHEIKH	60	27	100 Sugar + Crops	25	French FIVE LILLES CO. and Sugar Co. (1976)
2. Chemical Industries Projects						
2. Truck Tyres Plant	ALEXANDRIA	32	23	250 Thous. Tyres	25	French Michlen Co. American Goodyear (1976)
3. Glass Bottles	MOSTOROD (CAIRO)	12	8	50	7	American Thatchers Co. (1975)
3. Metallurgical Industries Projects						
4. Sponge Iron (Metalized Iron)	EL DEKHELA (Alexandria)	100	65	1600	45	American International Eng. Co. (1975 and 1976)
5. Steel Seamless Pipes	EL DEKHELA (Alexandria)	120	80	250	65	German Co. (1976)
6. Ductile Iron Pipes	SADAT CITY	23	15	70	12	German Krupp Co. (1975)
Grand Total II		347	218		214	

1/ The list does not include J/V projects concluded or settled.

III. NEW JOINT VENTURES PROJECTS Not Included In the Plant

1. Chemical Industries Projects

1- Magazine Paper from Sugar Cane Bagasse	KOS (Upper Egypt)	267	167	155	65	British Reed Co. (1975)

2. Metallurgical Industries Projects

2- Special Steel Rolled Products	SADAT CITY	85	55	150	30	Indian Dastur International Co. + Italian TECHNIT Co. (1974)
3- Graphite Electrodes and Carbon Products	SADAT CITY	30	20	26	20	Soviet NEFTICHIM (1975)

3. Engineering Industries Projects

4- Capital Goods	SADAT CITY (CIW.)	12	8	14	14	American Construction Engineering Co. (1975)
Grand Total III		394	250		129	

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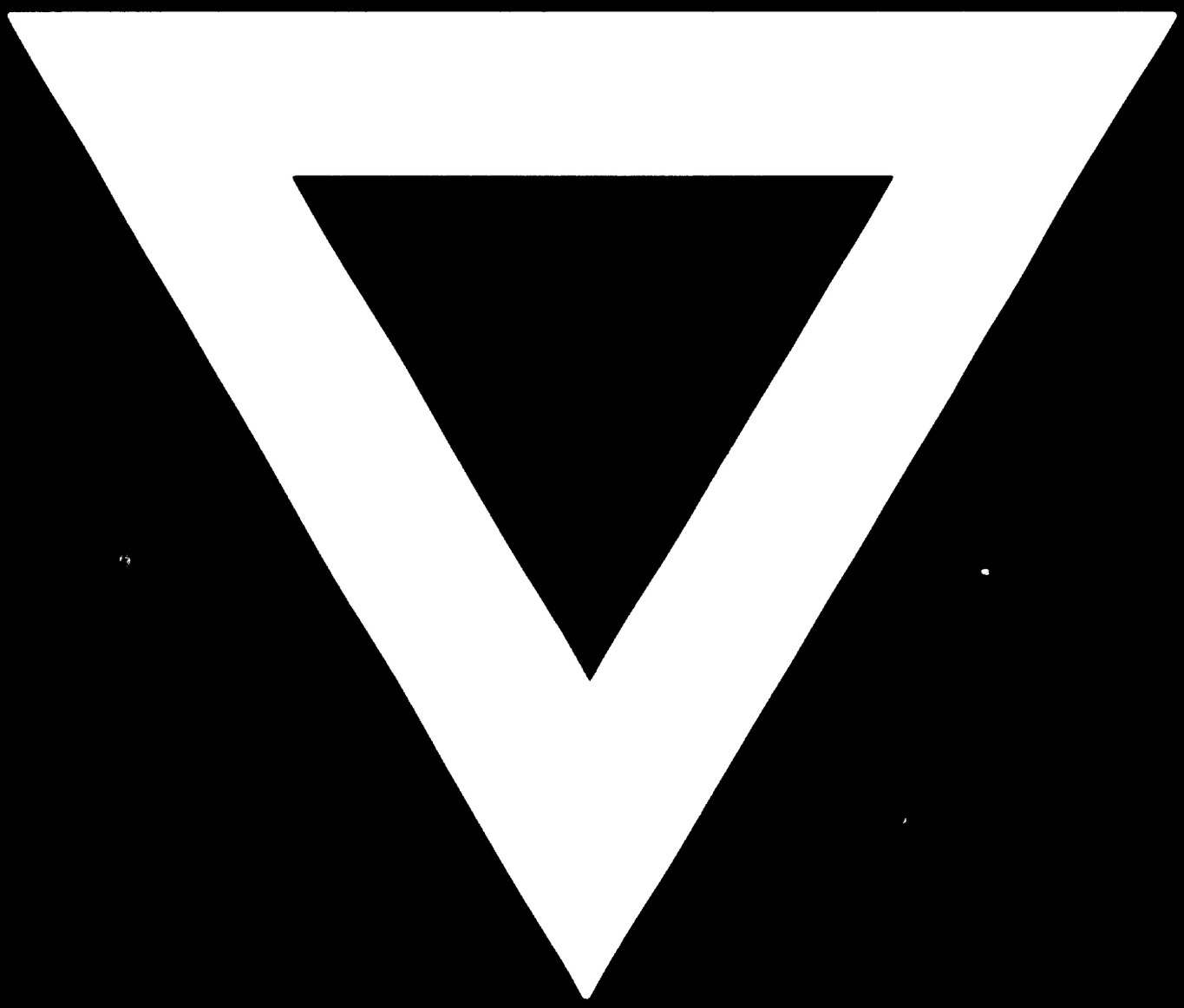

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