

A Study on Tendency of Industrial Accidents from 1979, in Korea

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—요 약—

우리나라는 근대화와 더불어 산업의 고도성장을 기약하면서, 예기치 못했던 산업재해로 말미암아, 많은 생명과 재산에 대해서 막대한 손실을 초래시키고 있다.

그러나 산업재해의 본질이 어디에 있고, 또 그것이 얼마나 크게 생산손실을 초래하고 있는지에 대해서 아직 과학적인 본질을 파악하고 있지 못하기 때문에 현실적으로 많은 재해손실을 감수하고 있는 것이 사실이다.

이와같은 입장에서 본 연구는 우선 1974년부터 1978년에 이르는 5개년간의 한국 산업재해의 본질을 이해하고 앞으로의 산업합리화를 위해서 그 대책을 강구해 보자는 것인데, 이를 위해서 본 연구는

1. 서론(문제의 제기)
 - 가. 연구방법
 - 나. 연구범위
2. 재해발생 상황
 - 가. 78년도 재해발생 상황
 - 나. 연도별 산업재해 추이
 - 1) 5년간 추이(지수비교)
 - 2) 전년도와 비교(%비교)
 - 다. 연도별 재해발생률(재해도수율, 강도율, 천인율)
 - 1) 재해도수율, 강도율
 - 2) 천인율
 - 라. 연도별 경제적 손실
3. 산업별 재해
 - 가. 산업별 재해상황
 - 나. 전년도와 비교
 - 다. 산업별 재해발생률

- 1) 재해도수율, 강도율
- 2) 재해년천인율
- 라. 산업별, 연도별, 재해도수율, 강도율, 천인율
 - 1) 광업
 - 2) 제조업
 - 3) 건설업
 - 4) 전기가스·수도업
 - 5) 운수보관·통신업
- 마. 산업별, 정도별 재해
4. 재해원인
 - 가. 원인별, 재해발생 실태
 - 나. 산업별 원인별 재해발생 실태
5. 결론

으로 고찰했으며 우리나라의 산업재해는 매년 상승되고 있다는 것이 고찰에서 나타났는데, 이와 같은 경향은 산업의 확산증대에도 영향이 없는 것은 아니지만 전체적으로 안전의식의 결핍이 가장 큰 요인인 것으로 판단된다. 따라서 공업입국에 의한 경제자립과 지속적인 번영을 위해서는

- ① 計數的인 合理主義를 強力히 排除하고 事實에 입각한 科學的인 安全對策을 수립해야 하며,
- ② 安全基準을 포함하는 모든 法令을 재정비하고, 團束法令으로서의 그것 보다는 指導啓蒙을 위한 關係法令을 조속히 제정해야 하며,
- ③ 安全意識을 啓發하여, 모든 能率管理, 生産性 向上의 根源으로 삼아야 할 것이며,
- ④ 安全專門研究機關을 적극적으로 育成하여 産業 災害의 本質的인 原因研明과 災害對策을 수립해야 할 것이다.

1. Introduction (The Presentation of Problems)

Our Country promised the rapid growth of industry with modernization. But, with unexpected industrial accidents, very large damage to human and prosperity, has originated.

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But it is true that we have put up with damage from accidents, because we don't know yet that when the essence of accidents is and how much it has originated production loss.

With these view points this study will understand, the essence of Korean Industrial Accidents for five years, from 1974 to 1978, at first, and consider how to cope with the situation for the future industrial rationalization.

a. Methodology

This study was attempted to seek the correct substance of Korean Industrial Accidents as following steps.

1. The Analysis of accident statistic announced already
2. The investigation of the actual condition by enquête
3. The confirmative investigation by field survey
4. The synthetic Analysis

b. Study Areas

As this study was regarded as a kind of attempt, it could not deal with everything. Therefore, each searching examination of cause will be done in another opportunity.

In this study, synthetic accident cause for the period 1974 — 1978, will be surveyed and the trend will be analyzed.

This study will be only the important base for new study.

2. The situation of accident occurrence

a. The situation of accident occurrence in the year 1978

Accident persons needed the rest from labour, for more than 8 days, were 139,242 persons dead 1,397 persons, Physical defective (permanently or temporarily impossible labor) 13,013 persons the other wounded (temporarily impossible labor wounded) 124,828 persons among labours of 3,105,757 persons worked in industrial field of 49,957 places applying the industrial accident insurance in the year 1978. So with direct loss of 30,420,000 thousand won and indirect of 121,680,000 thousand won (estimated), in total, economic loss of 152,100 million won and labour loss of 21,791,292 days were brought.

Fig. 1

| | | |
|--|-------------------------------------|---------------------|
| Object of application | Number of industrial places | 49,957 |
| | Number of labors | 3,105,757 |
| Accident person | Total | 139,242 |
| | the dead | 1,397 |
| | the wounded (physical defective) | 137,845 (13,013) |
| Amount of economic loss (million won) | Total | 15,210 |
| | Direct | 3,042 |
| | Indirect | 12,168 |
| Number of days of labor loss | | 21,791,292 |

* The number of applied labors is the number including daily labor of construction industry

* Estimation of indirect loss used Heinrich theory of America.

b. The Transition of Industrial Accidents by year

- 1) The Transition during five years (index comparison)

When we have seek the industrial accidents during the period 1974 ~ 1978, if index of the year 1974 as the basic year, was 100, industrial field, labor, accident person increased as 228.0, 218.3, 208.9 in the year 1978, respectively. Industrial field more increasing than the number of labor increasing from the year 1976, was caused by rapid increase of new middle — small enterprise, and expansion of industrial field range applied industrial accident insurance. The small rates of labor

increase and accident person increase, show that labor and accident persons are increasing without a large change.

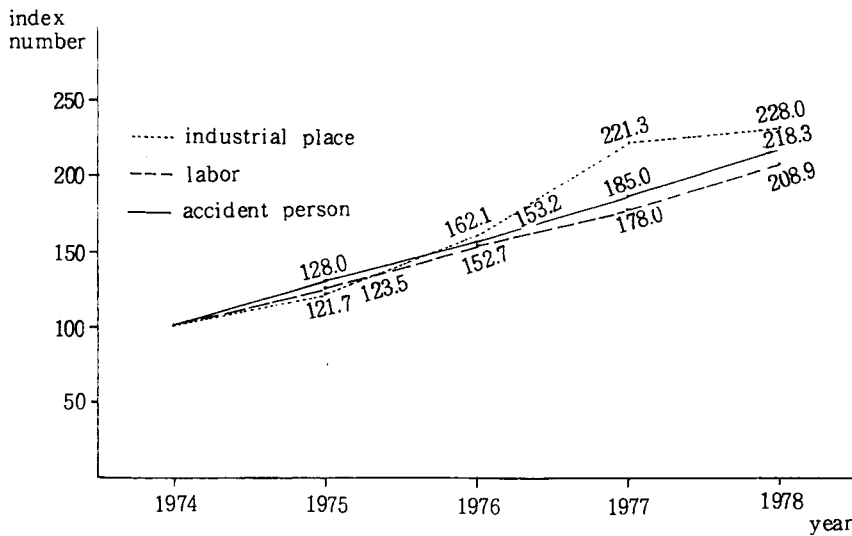


Fig 2

2) Comparing with last year (percent comparison)

Comparing with last year, the number of industrial places, 28.7 percent the number of labors 17.4% the number of accident persons 14.8 percent increased respectively.

The number of industrial places 28.7 percent increase to the number of labors 17.4 percent, was caused by a large number of small industrial fields being applied after industrial accident insurance had been revised in 1975, and the general accident (permanently or temporarily impossible labor), 14.8 percent results from occurrence of a large number of general accident persons because of lack of safety — health consciousness of small industrial field to improvement of safety facilities in dangerous industrial field.

Fig 3

| classification | year | | Change rate (a/b)% |
|-------------------------------|-----------|-----------|--------------------|
| | 1977 (b) | 1978 (a) | |
| Number of industrial places | 38,829 | 49,957 | 28.7 |
| Number of labors | 2,646,506 | 3,105,757 | 17.4 |
| Number of accident persons | 118,011 | 139,242 | 18.0 |
| Number of the deads | 1,174 | 1,397 | 19.0 |
| Number of physical defectiver | 11,336 | 13,013 | 14.8 |

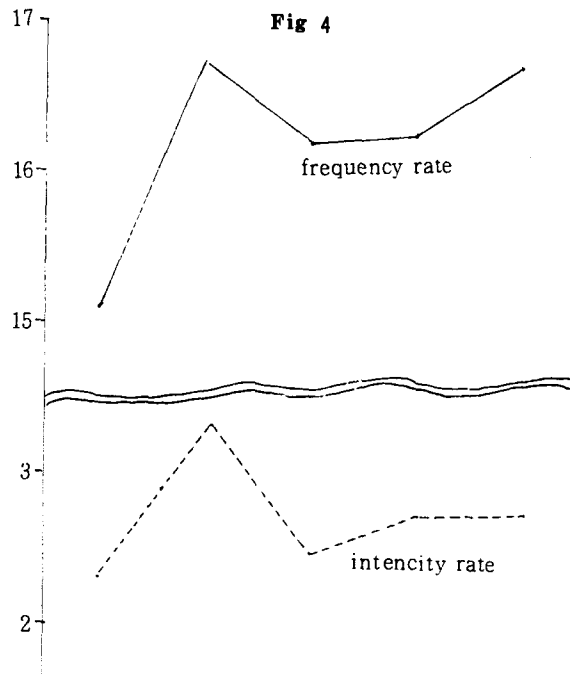
c. The Rate of Accident Occurence by year (Rate of accident frequency, intencity rate, thousand person rate)

1) Rate of accident frequency, intencity rate

Rate of accident frequency was 16.63 and accident intencity rate 2.74 in the year 1978. Rate of accident frequency is 0.57 higher than 16.06, accident intencity rate is 0.05 higher than 2.69 per annum, respectively in the period 1974~1977.

As accident rate has increased from 1975, rate of accident frequency increased 0.42, accident intencity rate increased 0.22 to the year 1977, respectively.

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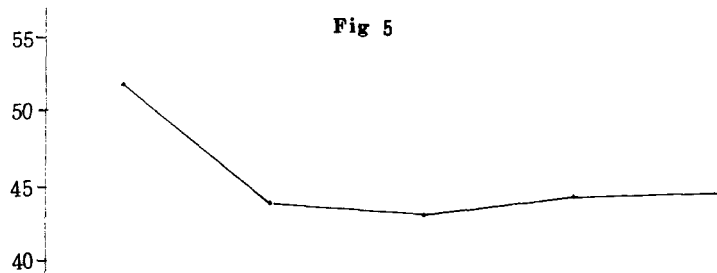


| classification \ year | 1974 | 1975 | 1977 | 1978 | 1979 |
|-----------------------|-------|-------|-------|-------|-------|
| frequency rate | 15.11 | 16.76 | 16.16 | 16.21 | 16.63 |
| intensity rate | 2.30 | 3.29 | 2.46 | 2.72 | 2.74 |

2) Thousand person rate

Seeing accident occurrence rate in respect of thousand person rate, it is 1.16 lower than 45.99 per annum in the period 74 - 77 but it is 0.23 higher than thousand person rate 44.60 in the year 1977.

These increases of accident occurrence rate resulted from expansion of small industrial field lacked safety-health consciousness of owner and labors, safety education, facilities and skill not to pararell such as rapide increase of use of the several energy caused by activeness of constructions, export increase and demand increase of daily necessary goods.



| classification \ year | 1974 | 1975 | 1976 | 1977 | 1978 |
|----------------------------|------------|-----------|-----------|-----------|-----------|
| thousand person rate | 51.84 | 44.46 | 43.50 | 44.60 | 44.83 |
| Number of labors | 13,531,671 | 1,836,209 | 2,269,796 | 2,646,506 | 3,105,757 |
| Number of accident persons | 70,142 | 81,641 | 97,716 | 118,011 | 139,242 |

d. Economic loss by year

Economic loss due to industrial accidents amounted to 30,420 million won and total loss included indirect loss amounted to 152,100 million won. This more increased 49.7 percent than amount of total loss of 10,810 million won in the year 1977, and amount of loss per accident unit increased as 1,092 thousand won in 1978 to which is 915 thousand won in 1977, that is, 11.9 percent increased.

It is seemed that major causes are improvement of giving level of industrial accident insurance amount and adjustment of medical fee.

Fig 6.

(Unit : thousand won)

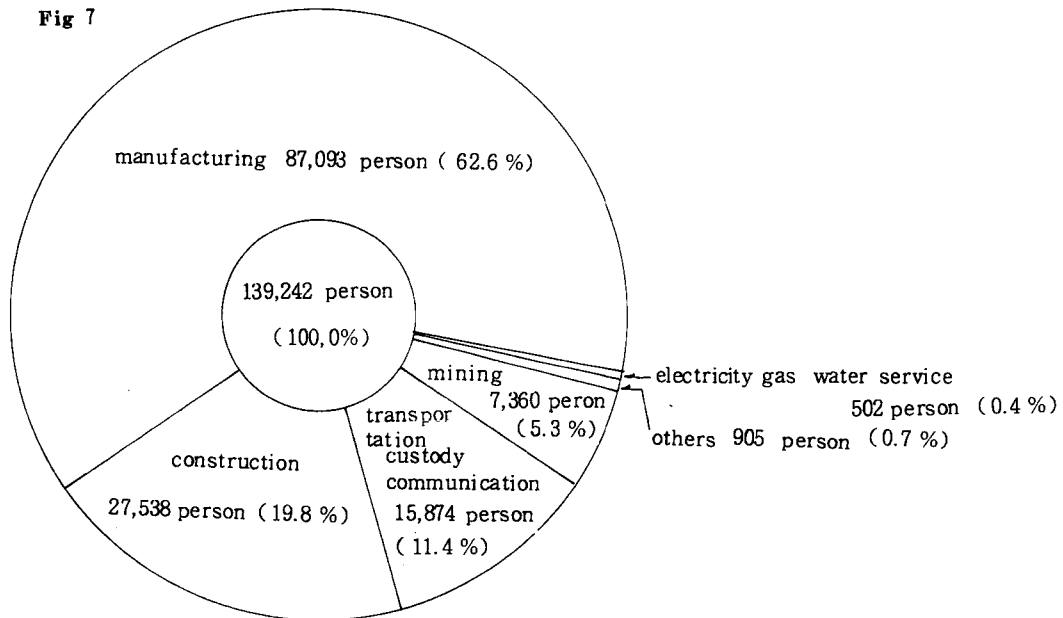
| classifi- cation year | Total | Amount of direct loss | Amount of (estimated) indirect loss | Amount of unit loss (won) |
|-----------------------------|-------------|--------------------------|--|------------------------------|
| 1974 | 32,584,646 | 6,516,929 | 26,067,717 | 473,298 |
| 1975 | 51,901,953 | 10,380,390 | 41,521,563 | 647,528 |
| 1976 | 63,354,198 | 12,670,839 | 50,683,359 | 648,350 |
| 1977 | 108,093,852 | 21,168,770 | 86,475,081 | 915,964 |
| 1978 | 152,092,664 | 30,418,532 | 121,674,132 | 1,092,305 |

3. Accidents by industry

a. Situation of Accidents by industry

Seeing Situation of accidents, by industry, 62.6 percent of total accidents occurred in manufacturing, and turn is as following : Construction industry 19.8 percent mining 5.3 percent, the others 0.7 percent, electricity-gas water service industry 0.4 percent.

Fig 7

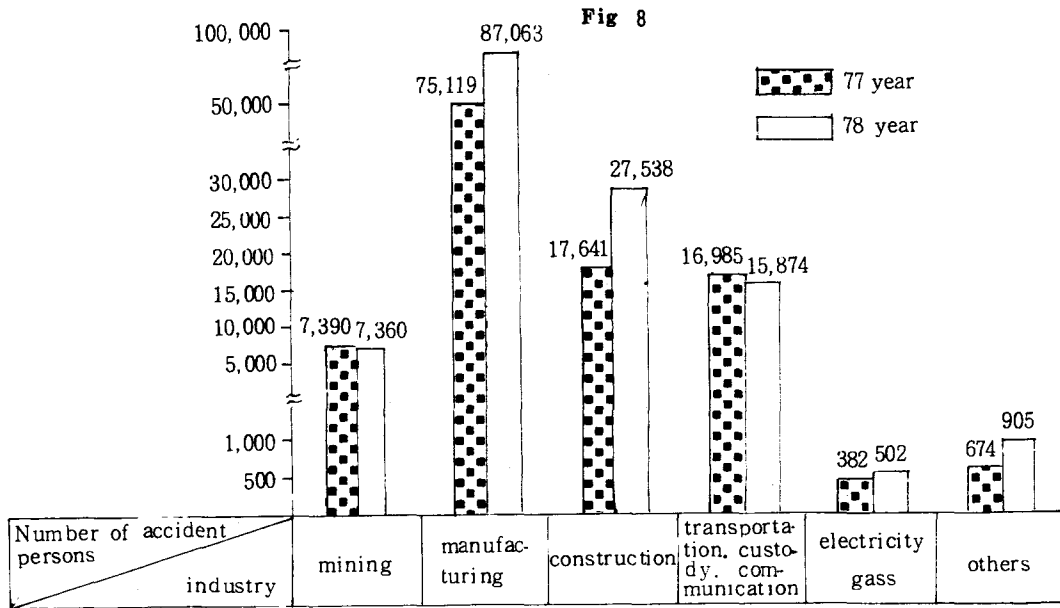


b. Comparing with last year.

Comparing with the number of accident persons in the year 1977, manufacturing increased 15.9 percent construction 57.8 percent, electricity gas water service industry 31.5 percent, the others 34.35 percent, respectively, but transportation decreased 6.5 percent, mining 0.04 percent, respectively.

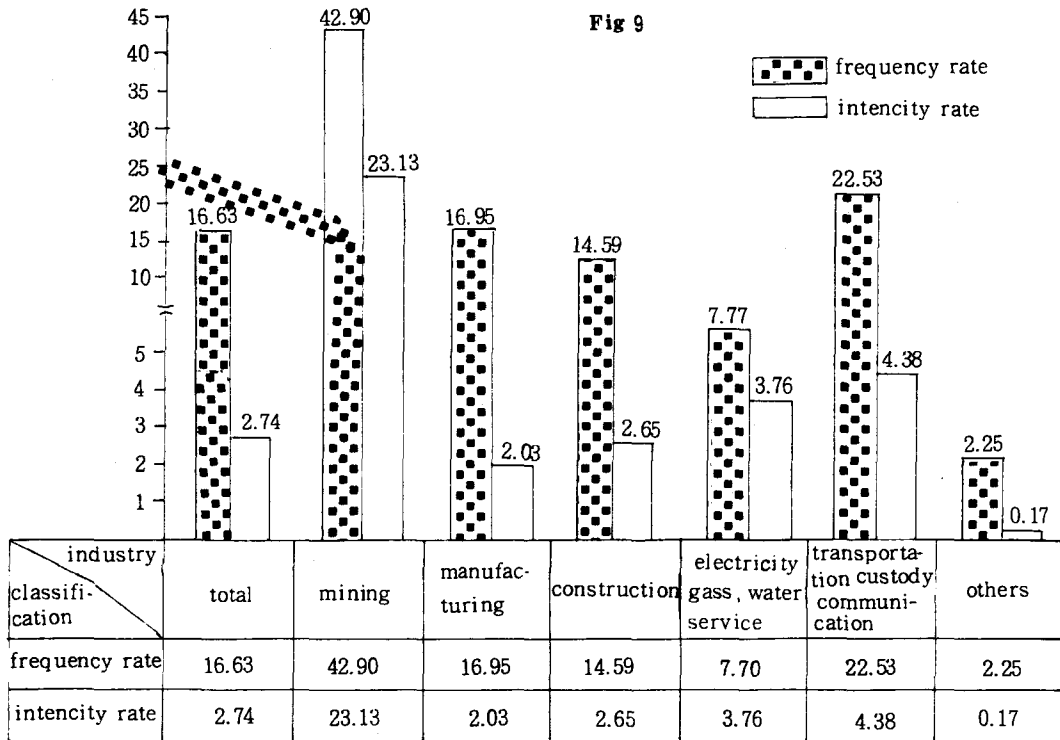
This phenomena of accident increase seems to be caused by increase of the total number of labor

according to alive starting of large consturctions and public works



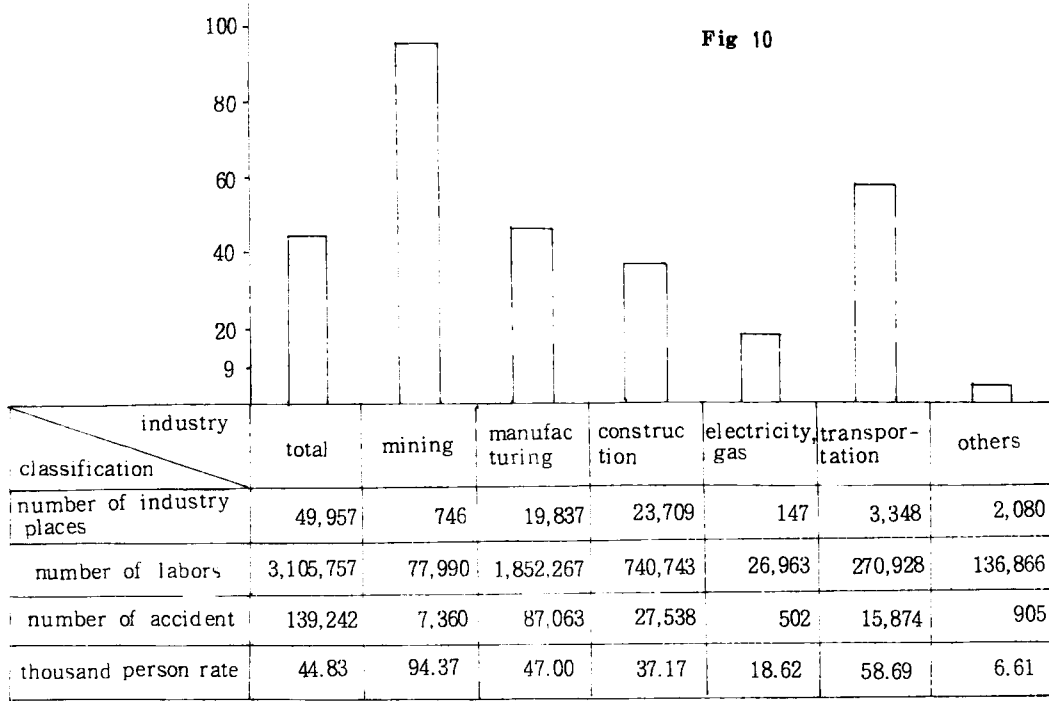
c. The rate of Accident Occurrence by industry

1) Rate of Accident Frequency, Intensity rate.



2) Thousand person rate in accident year

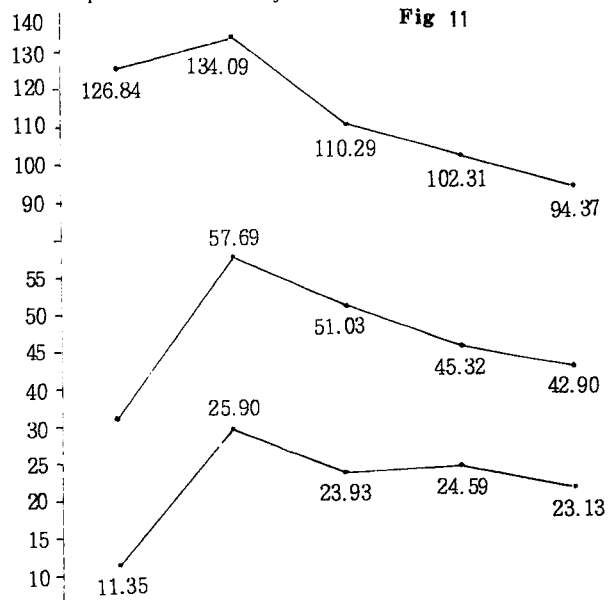
As to thousand person rate, mining in which work dangerous rate is the high, is highest as 94.37 and transportation 58.59, manufacturing 47.00 construction is 31.17 and next ranking is according to electricity-gas, water service and the others especially, mining decreased from 102.31 to 94.37, transportation from 72.56 to 58.59 respectively but manufacturing increased from 44.50 to 47.00, construction from 34.98 to 37.17 respectively.



d. Rate of accident Frequency intency rate Thousand person rate by industry and year

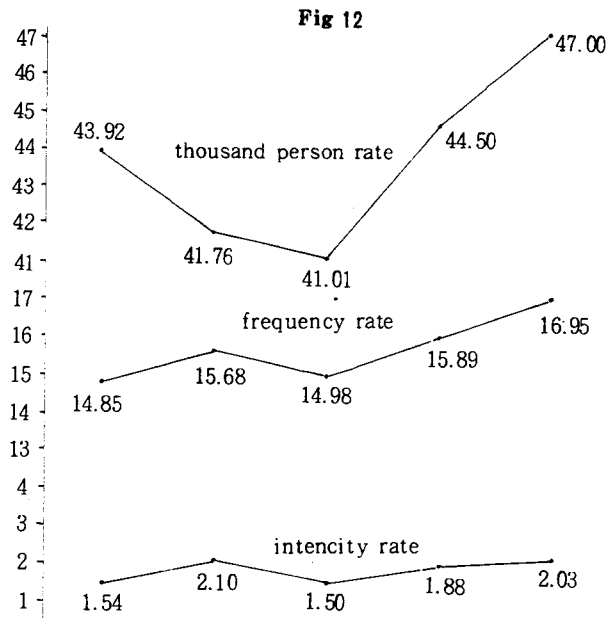
1) Mining industry

The frequency rate of accident occurrence has decreased every year after the year 1975, and Safety rate of region of mining has improved remarkably



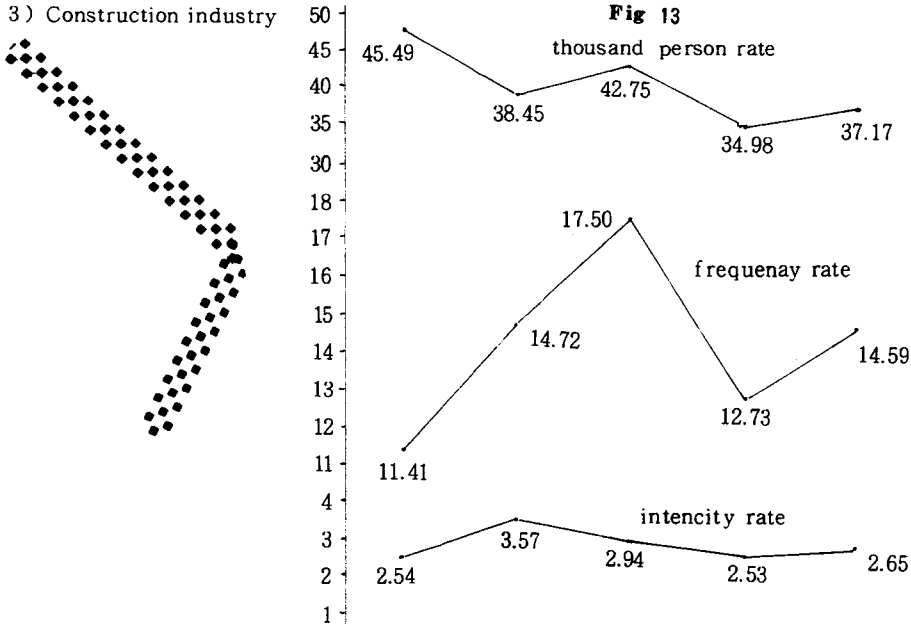
| year | 1974 | 1975 | 1976 | 1977 | 1978 |
|----------------------|--------|--------|--------|--------|-------|
| thousand person rate | 126.84 | 134.09 | 110.29 | 102.31 | 94.37 |
| frequency rate | 31.95 | 57.69 | 51.03 | 45.32 | 42.90 |
| intency rate | | 25.90 | 23.93 | 24.59 | 23.13 |

2) Manufacturing industry



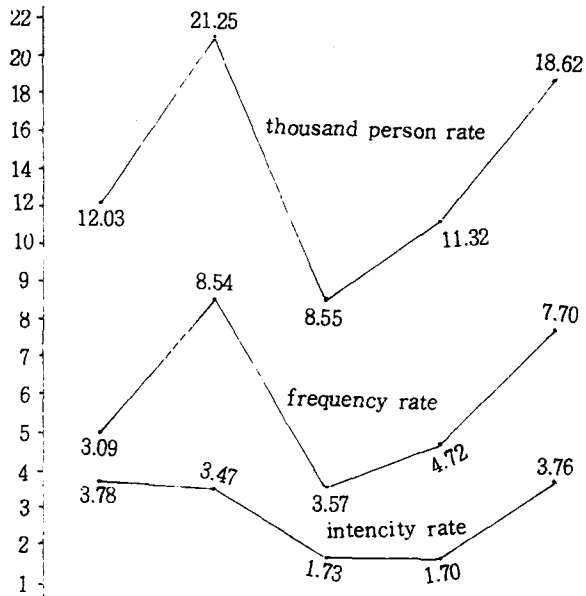
| classification \ year | 1974 | 1975 | 1976 | 1977 | 1978 |
|-----------------------|-------|-------|-------|-------|-------|
| thousand person rate | 43.92 | 41.76 | 41.01 | 44.50 | 47.00 |
| frequency rate | 14.85 | 15.68 | 14.98 | 15.89 | 16.95 |
| intensity rate | 1.54 | 2.10 | 1.50 | 1.88 | 2.03 |

3) Construction industry



| classification \ year | 1974 | 1975 | 1976 | 1977 | 1978 |
|-----------------------|-------|-------|-------|-------|-------|
| thousan person rate | 45.49 | 38.45 | 42.75 | 34.98 | 37.17 |
| frequency rate | 11.41 | 14.72 | 17.50 | 12.73 | 14.59 |
| intensity rate | 2.54 | 3.57 | 2.94 | 2.53 | 2.65 |

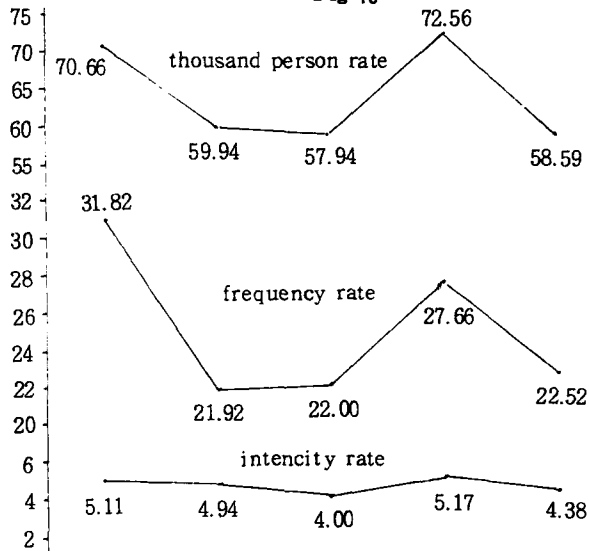
4) Electricity gas - water service industry



| classification | year | 1974 | 1975 | 1976 | 1977 | 1978 |
|----------------------|------|-------|-------|------|-------|-------|
| thousand person rate | | 12.03 | 21.25 | 8.55 | 11.32 | 18.62 |
| frequency rate | | 5.09 | 8.54 | 3.57 | 4.72 | 7.70 |
| intensity rate | | 3.78 | 3.47 | 1.73 | 1.70 | 3.76 |

5) Transportation- custody - communication industry

Fig 15



| classification | year | 1974 | 1975 | 1976 | 1977 | 1978 |
|----------------------|------|-------|-------|-------|-------|-------|
| thousand person rate | | 70.66 | 59.94 | 57.94 | 72.56 | 58.59 |
| frequency rate | | 31.82 | 21.92 | 22.00 | 27.66 | 22.52 |
| intensity rate | | 5.11 | 4.94 | 4.00 | 5.17 | 4.38 |

Rate of Accident Frequency and Intensity Rate by industry and year

| industry | year | 1974 | 1975 | 1976 | 1977 | 1978 | rain mark |
|------------------|-----------|-------|-------|-------|-------|-------|-----------|
| | | | | | | | |
| Total | frequency | 15.11 | 16.76 | 16.16 | 16.21 | 16.63 | |
| | intensity | 2.30 | 3.29 | 2.46 | 2.72 | 2.74 | |
| Mining | frequency | 31.95 | 57.69 | 51.03 | 45.32 | 42.90 | |
| | intensity | 11.35 | 25.90 | 23.93 | 24.59 | 23.13 | |
| Manufacturing | frequency | 14.85 | 15.68 | 14.98 | 15.89 | 16.95 | |
| | intensity | 1.54 | 2.10 | 1.50 | 1.88 | 2.03 | |
| Construction | frequency | 11.41 | 14.72 | 17.50 | 12.73 | 14.59 | |
| | intensity | 2.54 | 3.57 | 2.94 | 2.53 | 2.65 | |
| Electricity gass | frequency | 5.09 | 8.54 | 3.57 | 4.72 | 7.67 | |
| | intensity | 3.78 | 3.47 | 1.73 | 1.70 | 3.76 | |
| Transportation | frequency | 31.82 | 21.49 | 22.00 | 27.66 | 22.52 | |
| | intensity | 5.11 | 4.94 | 4.00 | 5.17 | 4.38 | |
| Others | frequency | 0.55 | 1.91 | 1.88 | 2.19 | 2.25 | |
| | intensity | 0.16 | 0.92 | 0.53 | 0.44 | 0.71 | |

e. Accident by industry and degree

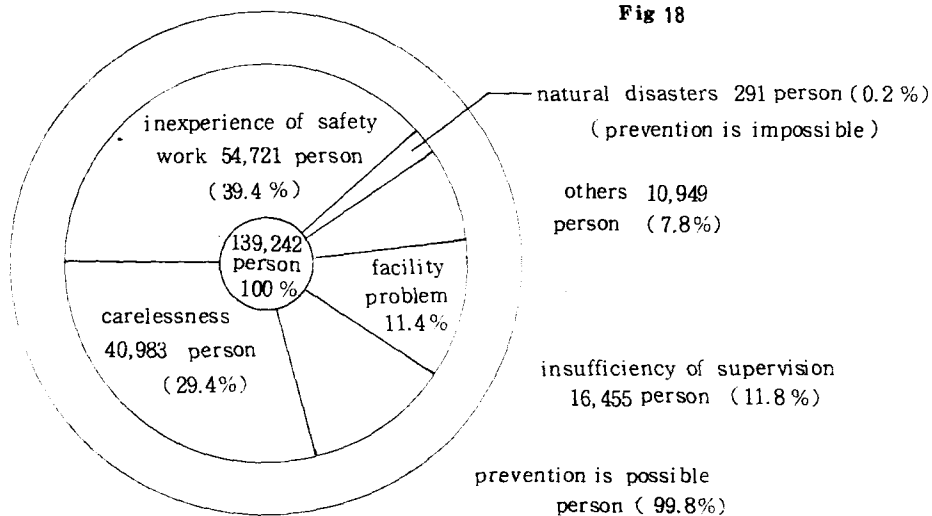
Analyzing the degree of damage of industrial accident, 99.0 percent of total accidents are wounded accidents needing rest of work more than 8 days, (physical defectives are 9.4 percent among the wounded accidents), the dead accident occupied 1.0 percent

| industry | classification | Total Number of accident person | Number of the dead | Number of the wounded | Number of physical defective |
|--------------------------------------|----------------|---------------------------------|--------------------|-----------------------|------------------------------|
| Total | | 139,242 | 1,397 | 137,845 | 13,013 |
| Mining | | 7,360 | 251 | 7,109 | 1,497 |
| Manufacturing | | 87,063 | 412 | 86,651 | 9,533 |
| Construction | | 27,538 | 393 | 27,145 | 1,410 |
| Electricity gass water service | | 502 | 21 | 481 | 39 |
| Transportation communication custody | | 15,874 | 291 | 15,583 | 493 |
| Others | | 905 | 29 | 876 | 41 |

4. Cause of Accident

a. The realities of Accident Occurrence by cause

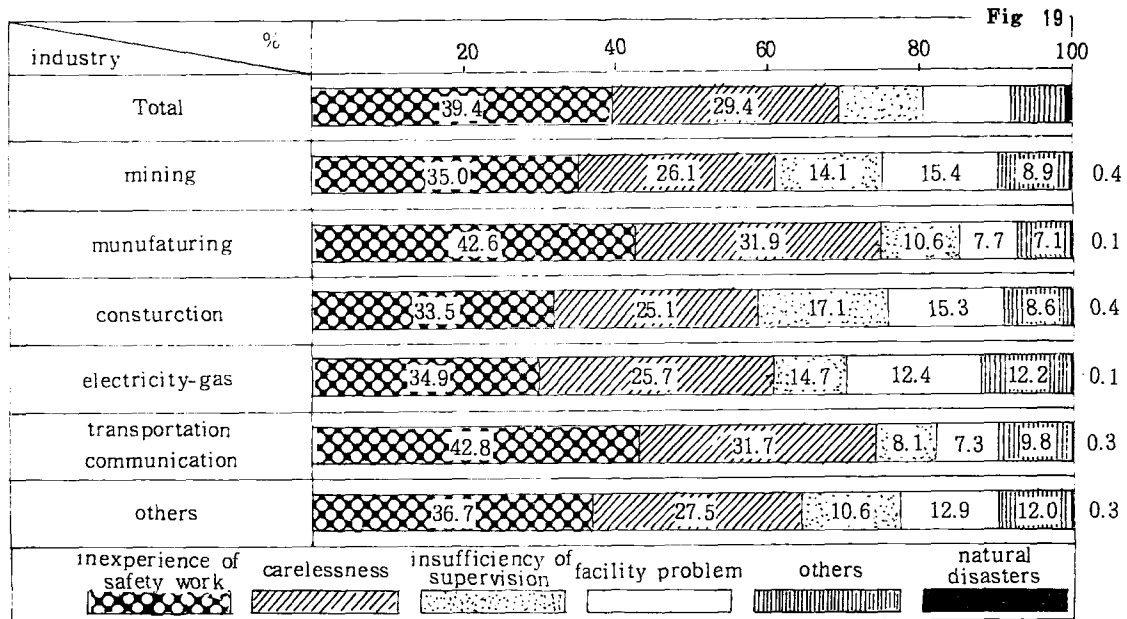
Fig 18



Unknowlege and immaturity of safety work methods such as labor's inexperience in his work or enforcing the dangerous work without authority, and accidents caused by carelessness such as unstable affitude, have occupied 66.8 percent of total accidents, in major cause of accidents, and accidents occurred by lack consciousness of accident prevention, are 11.8 percent, accidents caused by insufficiency of supervision 11.8 percent, others 7.8 percent, respectively Accidents to be able to prevent are 99.8% those to be unable to prevent such as natural disasters, occupied 0.2 percent.

b. The Realities of Accident Occurrence by industry and cause

Analyzing industrial accidents, by cause, accidents caused by inexperience of safety work and carelessness of labors, occurred most frequently in manufacturing at which work process is diversified, and accidents caused by facility problem occurred most frequently in mining and construction, which is dangerous.



5. Conclusion

It is true that industrial accidents of our country has increased every year such trend is caused by lack of safety consciousness as well as expansion and increase of industry

There fore, We should do as following, for independence of economy and continuous prosperity by industrializing the nation.

- (1) Eliminating numerical rationalization, strongly and considering scientific counter-measures of safety, in reality.
- (2) Revising all low's including safety criteria and establishing relevant laws for guidance and enlightenment than diciplinary laws, rapidly.
- (3) Developing the safety consciousness and making the base of efficiency control and productivity improvement.
- (4) Bring up professional safety study facilities, possitively and studing substantial causes of industrial accidents and considering counter- measures of accidents.

< References >

- 1) Yi Geun Heui, A Study on Safety Control Technique and Situation Judgement Data, 9th Asian Conference on Occupational Health, 1979.10, 23.
- 2) Yi Geun Heui, A Study of a new Production Control System, 4th International Conference of Production Resarch 1978, 8, 25.
- 3) Yi Geun Heui, The General theory of Scientific Management, Industnial Accident and Human Engineering 16th International Occupational Industrial Health 1969, 9.
- 4) Yi Geun Heui, The Study of Ergonomical Effects on Product Action, 5th Asian Conference on Occupational Health, 1968, 11, 17.