

**International Academic Multidisciplinary Research Conference 2017**

**Conference Proceedings**

**INTERNATIONAL BUSINESS ECONOMIC TOURISM SCIENCES TECHNOLOGY  
HUMANITIES SOCIAL SCIENCES AND EDUCATION RESEARCH CONFERENCE**

*London, United Kingdom  
5 – 7 April, 2017*

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*The International Education Social Sciences and Humanities Research Conference*

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# Conference Proceedings

INTERNATIONAL BUSINESS ECONOMIC TOURISM SCIENCES TECHNOLOGY  
HUMANITIES SOCIAL SCIENCES AND EDUCATION RESEARCH CONFERENCE

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## INTRODUCTION

We would like to welcome our colleagues to the International Business Tourism Transport Technology Social Sciences Humanities Education Research Conference. It is the seven series in 2016 of Conference on Business Tourism and Apply Sciences was held in Amsterdam. As always many members of the ICBTS 2016 community look forward to meeting, sharing and exchanging their research ideas and results in both a formal and informal setting which the conference provides. Likewise, the concept of alternating the international conference every one month on April to November between Europe and the rest of the world is now well established. This year's event in London (UK) Paris (France) Munich (Germany) Amsterdam (Netherlands) Boston (USA) Toronto (Canada) London (United Kingdom) Zurich (Switzerland) Berlin (Germany) Tokyo (Japan) and another continues with the cultural following the very successful and productive event held in London-Zurich in August 2016 in the field of various types for international academic research conference on Business Economics Social Sciences Humanities Education and Apply Sciences. As usual The ICBTS 2016 brings together leading academics, researchers and practitioners to exchange ideas, views and the latest research in the field of Business Tourism and Apply Sciences.

The theme of this event The 2016 ICBTS International Business Tourism Social Sciences Humanities and Education Research Conference is "Opportunities and Development of Global Business Economics Social Sciences Humanities and Education" It is also represents an emerging and highly challenging area of research and practice for both academics and practitioners a like, The current industrial context is characterized by increasing global competition, decreasing product life cycles, Global Business, Tourism Development, Social Sciences Humanities Education Apply Sciences and Technology collaborative networked organizations, higher levels of uncertainties and, above all, and customers. In our view holding this event in Tokyo represents a timely opportunity for academics and researchers to explore pertinent issues surrounding Business Economics Tourism Social Sciences Humanities Education Sciences and Technology.

Potential authors were invited to submit an abstract to the International Conference Session Chairs. All abstracts were reviewed by two experts from the International review committee and final papers were further reviewed by this volume with 30 contributing authors coming from 18 countries. This book of proceedings has been organized according to following categories:

- Business
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- Social Sciences
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# TABLE OF CONTENTS

## ORGANIZE

## INTRODUCTION

## INTERNATION ADVISORY COMMITTEE

## INTERNATIONAL COMMITTEE

## SPEAKER

CROSS-SECTIONAL STUDY TO IDENTIFY THE PREVALENCE OF ABUSE AND ITS TYPES, ITS CAUSES AND ITS RESOURCES FOR A SAMPLE OF CHILDREN AND ADOLESCENTS	1
<i>Raghad Ibrahim, Mohammed Baqir</i>	
THE IMPACT OF CORPORATE SOCIAL RESPONSIBILITY ON EGYPTIANS' PURCHASE INTENTION "THE CASE OF TELECOMMUNICATION SECTOR IN ALEXANDRIA"	22
<i>Dina ElSalmy, Ahmed ElSamadicy, Mohamed Mostafa</i>	
DEVELOPMENT OF ANALYTICAL READING BASED ON THE TRANSACTIONAL STRATEGIES INSTRUCTION	33
<i>Tasanee Sathapong</i>	
BLENDED LEARNING MODEL AND ACHIEVEMENT IN A FOUNDATION OF MARKETING COURSE	39
<i>Narumon Chomchom</i>	
TOURISM LIFE CYCLE ANALYSIS AND SUSTAINABLE TOURISM MANAGEMENT FOR URBAN CULTURAL TOURIST ATTRACTION: A CASE STUDY OF KOH KRED, THAILAND	46
<i>Siripen Yiamjanya</i>	
OPPORTUNITY TO INCLUDE A SECONDARY DESTINATION FOR TOURIST EXPERIENCES WITH HERITAGE POTENTIALS THE CASE STUDY OF KHIRIWONG COMMUNITY, LANSKA DISTRICT, NAKHON SI THAMMARAT, THAILAND	56
<i>Nuntana Ladplee</i>	
GENERATION 'Y' (MILLIANIAL TOURIST) PERCEPTIONS AND VISITATION PATTERNS TOWARDS MUSEUMS	64
<i>Tran Trung Kien and Dr. Vipin Nadda</i>	
THE IMPACT OF CORPORATE SOCIAL RESPONSIBILITY ON CORPORATE REPUTATION CAPITAL	89
<i>Kritchana Santawee</i>	
MARKETING MIX OF OTOP: FROM THAI LOCAL WISDOM TO GLOBAL THROUGH THAI AIRWAYS INTERNATIONAL	99
<i>Krongthong Khairiree</i>	
THAILAND AND TECHNOLOGICAL PRODUCTS: A SOCIAL SCIENCES CASE STUDY	104
<i>Darma R. Khairiree</i>	
FACTORS RELATED TO SPORTS OR EXERCISE BEHAVIORS OF THAI PEOPLE	110
<i>Dr.Rattana Panriansaen, Dr.Kingkanok Saowapawong and Kantapong Prabsangoba</i>	
9/11 THE DOMESTICS CRUSADERS REGISTERS VIOLENCE AGAINST MUSLIMS FOLLOWING 9/11	116
<i>Rehab Farouk and Mona Anwar</i>	
THE CONTRIBUTIONS OF WOMEN ENTREPRENEURS IN SOCIOECONOMIC DEVELOPMENT (A STUDY OF SELECTED LOCAL GOVERNMENTS IN ANAMBRA STATE NIGERIA)	143
<i>Muogbo Uju .S. PhD</i>	
FACTORS AFFECTING TOURISTS DECISION MAKING IN CHOOSING HOMESTAY IN AMPHAWA DISTRICT, SAMUTSONGKRAM, THAILAND	154
<i>Kanamon Suwantada</i>	
INTENTION TO VISIT GREEN HOTELS OF THAI TOURISTS IN BANGKOK, THAILAND	159
<i>Kanyapilai Kunchornsirimongkon</i>	
NEW DIMENSIONS TO ADMINSTRATE HUMAN DEVELOPMENT TO CONSERVE BUDDHISM OF MAHAYANA CHINESE SECT: THE STUDY OF MUNGKORNKAMALAWAS CHINESE TEMPLE, BANGKOK	167
<i>Saowapa Phaithayawat, Suwaree Yodchim, Yaninie Phaithayawat</i>	
DEVELOPMENT OF STUDENT TEACHERS' REFLECTIVE THINKING ABILITIES	172
<i>Sucheera Mahimuang</i>	

SAFETY BEHAVIOR OF OPERATION STAFFS IN WATER PRODUCTION AND SUPPLY DEPARTMENT BANGKHEN WATER PLANT, BANGKOK, THAILAND <i>Pongsak Jaroengarmsamer, Wanwimon Mekwimon Kingkaew</i>	177
PROSPECTIVE STUDY OF RABIES ELIMINATION MODEL AND STRATEGY, FORMULATED BY THE PEOPLE IN 2-EPIDEMIC COMMUNITIES <i>Thavatchai Kamoltham, Wattanasak Sornrung, Chalatchawan Nanui</i>	184
JOB SATISFACTION AND EMPLOYEE PRODUCTIVITY IN THE NIGERIAN PUBLIC SECTOR (A STUDY OF ANAMBRA STATE UNIVERSITY) <i>Ezeamama Ifeyinwa G.</i>	191
AN OUTLOOK OF STOCK MARKET PERFORMANCE AND ITS CONTRIBUTION TO ECONOMIC GROWTH: BRICS AND MINT <i>Behiye Korpe</i>	202
DEMONETIZATION IN INDIA: AN OVERVIEW <i>Abhinav Singh Chandel</i>	203
EFFECT OF AROMA OIL MASSAGE AND HERBAL COMPRESSION WITH ANALGESIC DRUGS ON PAIN IN PERSONS WITH LOW BACK PAIN <i>Ladaval Ounprasertpong Nicharajana, Chanvate satthaputh MD</i>	205
THE APPLICATION OF PALMISTRY KNOWLEDGE IN THE DIAGNOSIS OF DISEASES FOLLOWING THE PRINCIPLES OF TRADITIONAL THAI MEDICINE <i>Phatphong Kamoldilok, Orawan Sinpaiboonlert, Mukda Tosang</i>	212
PIET MONDRIAN'S PAINTING INSPIRED YVES SAINT LAURENT, THE WORLD CLASS FASHION DESIGNER <i>Jaruphan Supprung</i>	217
SOCIAL SUPPORT OF POSTPARTUM MOTHERS BASED ON FOLK MEDICINE IN NAKORN PATOM PROVINCE, THAILAND <i>Supparas Oatsawaphonthanaphat, Wichai Srikam, Vichai Chokevivat</i>	223
DEA MODEL MEASURING AIRPORT PERFORMANCE IN THAILAND <i>Piyaon Sriwan</i>	231
COMMUNICATION BILINGUAL APPROACH IN A THAI SCHOOL ON VOCABULARY AT HOME AND AT SCHOOL <i>Suwaree Yordchim, Goragot Butnian, Palaunnaphat Siriwongs</i>	237
DIABETES CARE AND PATIENTS' PERSPECTIVES ON DIABETES MELLITUS IN RURAL THAILAND: A QUALITATIVE STUDY <i>Kantapong Prabsangob</i>	243
AN ANALYTICAL STUDY OF SOCIAL PROBLEMS OF WOMEN RELATED TO SPORTS <i>Shagufta Jahangir, Dr. Asma Manzoor, Dr. Nusreen Aslam Shah, Raisa Jahangir</i>	249
THE INVESTIGATION OF CLINICAL EXPERIENCE ON LEARNING BEHAVIORS AND STRESS FOR NURSING STUDENTS <i>Yen-ju Hou</i>	250
LONDON INTERBANK OFFER RATE VOLATILITY: THE US DOLLAR, THE BRITISH POUND, THE JAPANESE YEN AND THE EURO: HOW IT AFFECTS MULTINATIONAL COMPANIES (1986-2016) <i>Alhassan Ndekugri</i>	262
CORRUPTION, POLITICAL ACCOUNTABILITY AND THE CHALLENGES OF GOVERNANCE IN NIGERIA <i>Imoukhuede Benedict Kayode</i>	280
THE PARTICIPATION IN THE DEVELOPMENT OF PACKAGING AND LOGOS TO THE NEEDS OF THE CONSUMER PRODUCTS KHANEONGHIN COMMUNITY PERSONNEL BANGKOK <i>Jitima Suathong, Supassawee Morakul, Worraruethai Harnchotipan</i>	290
LIFE QUALITY PROMOTION FOR THE ELDERLY <i>Ponpun Vorasiha, Anchalee Jantapo</i>	295
FABRIC PRINTING DESIGN, AN INSPIRED FROM THAI TRADITIONAL TIN TOYS <i>Suwit Sadsunk</i>	301
THE ART OF DESIGNING, FABRIC PATTERN BY MOLD WITH NATURAL DYES <i>Chanoknart Mayusoh</i>	311
HEALTH PROBLEMS AND NEEDS FOR HEALTH SERVICE OF THE ELDERLY: A CASE STUDY OF ELDERLY IN TAMBON WANGTAKOO, NAKORN PATHOM PROVINCE, THAILAND <i>Prapaiwan Danpradit, Boonsri Kittichotipanich</i>	319

OUTCOME OF FOOT CARE EDUCATION PROGRAM IN DIABETIS MELLITUS AT PREMRUTHAI PRAVATE COMMUNITY BANGKOK	325
<i>Tipapan Sungkapong, Boonsri Kittichottipanich, Namthip Martkoksoong</i>	
TOURISM IMPACT ON DESTINATION ECONOMY: EVALUATING THE RELATIONSHIP BETWEEN TOURISM RECEIPTS AND ECONOMIC GROWTH IN THE UK	331
<i>Abimbola Alexandra Dada, Adenike Adebola Adesanmi, Dr. Vipin Nadda</i>	
MEDIA LITERACY: ADVANTAGES AND APPLICATIONS A CASE STUDY OF SRINAKHARINWIROT UNIVERSITY	343
<i>Sasithon Yuwakosol</i>	
ASSESSMENT OF THE RELATIONSHIP BETWEEN HUMAN RESOURCE MANAGEMENT PRACTICES AND PERFORMANCE OF HOTELS IN KENYA	354
<i>Owiti, Phelix Onyango, Erick Fwaya</i>	
PARENTAL EDUCATION BACKGROUND AND STUDY MATERIALS AS CORRELATES OF ACADEMIC PERFORMANCE OF SECONDARY STUDENTS IN ABIA STATE	355
<i>Beatrice Okore Ogbonnaya</i>	
THE CONSEQUENCES OF POOR CURRICULUM IMPLEMENTATION IN NIGERIA	356
<i>Okorafor philomena nmennaya (ph.d)</i>	
THE EFFECTS OF WORL CHARACTERISTICS AND SELF-ESTEEM ON WORK BURNOUT FOR ENTRY—LEVEL EMPLOYEES IN HOTELS	357
<i>Hany Hosny Sayed Abdelhamied</i>	
EMPOWERMENT PROGRAM ON PROMOTING PERCEIVED SELF-EFFICACY AMONGPREGNANT WOMEN FOR PREVENTING GESTATIONAL DIABETES MELLITUS	358
<i>Napissara Dhiranathara, Petcharat Techathawewon</i>	
THE STUDY OF SEXUAL HEALTH BEHAVIORS IN ADOLESCENT	364
<i>Boonsri Kittichottipanich, Udornporn Yingpaiboonsuk, Saree Dangtongdee, Ancha Dangtongdee</i>	
EDUCATION PROGRAM ON PROMOTING PERCEIVED SELF-EFFICACY IN PREGNANCY WOMEN FOR DIABETES MELLITUS PREVENTION	369
<i>Petcharat Techathawewon, Warunsiri Praneetham</i>	
THE EFFECTSOFT HAI MIND-BODY EXERCISE“RUSIE DUTTON” ON BODY WEIGHT AND BLOOD LIPID LEVEL INMENOPAUSAL WOMEN	374
<i>Kanit Ngowsiri, Assoc. prof. Suchitra Sukonthasab, Assoc. prof. Prasong Tunmahasamut</i>	
EDUCATION PROGRAM OUTCOMES IN PREGNANCY PREVENTION OF SEX-RISK FEMALE ADOLESCENTS: A CASE STUDY OF STUDENTS IN S AMUT-SONGKRAM PROVINCE, THAILAND	380
<i>Premwadee Karuehadej</i>	
STUDY OF SEX HEALTH KNOWLEDGE AND DEMAND OF SEX HEALTH CARE IN UNDERGRADUATE STUDENTS	386
<i>UdornpornYingpaiboonsuk, KanyaNapanglk, Boonsri Kittichottipanich, AnchaDangthongdee</i>	
ENVIRONMENTAL MANAGEMENT BEST-PRACTICE AND STRATEGIES WITHIN THE INSTITUTIONAL CONTEXT: THE CASE OF (UAE)	394
<i>Dr.Ahmed Zain Elabdin Ahmed</i>	
Activity-Based Costing of Library Services in Universities – A Case Study of a Private University	409
<i>Dr.Hala Elias</i>	
Influence of Cultural dimensions on Management practices in Hospitals: A Study of Indian Subcontinent	411
<i>Dr.Devjani Chatterjee</i>	
PROMOTION OF EXERCISE FOR THE ELDERLY	424
<i>Anchalee Jantapo, Ponpun Vorasiha</i>	
PATTERN DESIGN FROM THE CONCEPT OF THE CARP FISH WEAVE	430
<i>Siracha Samleethong</i>	
THE HISTORY OF THAI WOMEN LINGERIE	437
<i>Junjira Monnin</i>	
SATISFACTION OF URINATION PROMOTION IN BENIGN PROSTATIC HYPERPLASIA	446
<i>Kanya Napapongsa, Warunsiri Praneetham, Nopbhornphetchara Maungtoug, Kanit Ngowsiri</i>	
EXPLORING HEALTH STATUS AMONG OLDER ADULTS IN THE URBAN COMMUNITY OF BANGKOK, THAILAND	452
<i>Chotisiri, L, Charoonpongsak, A</i>	
Face-to-face learning, cross-cultural virtual teams and study abroad: Incorporating experiential learning into a multi-modal class	458
<i>Denise Luethge, Carole Cangioni</i>	

TOURISM REVENUES REGRESSION FOR TOURISM PROMOTION INVESTMENT DECISION– MADEIRA CASE STUDY <i>Élvio José Sousa Camacho</i>	460
Alauddin Malay King Mosque- searching for architectural symbols and identity <i>Roslan Bin Talib</i>	461
THE TEACHING OF ENGLISH LANGUAGE AS A MEANS TO AN END FOR BUSINESS TOURISM <i>Nande C.K. Neeta</i>	462
Dealing with Identity Loss and Stigma of Unemployment in Georgia - Perspective of Youth <i>Anastasia Kitiashvili</i>	468
The Portuguese Presence in the Arabian Gulf as Reflected in Local Omani Historical Narratives <i>Hasan Al Naboodah</i>	469
Antecedents of Customer Satisfaction Levels in UAE Museum Shops <i>Akin Fadahunsi and Salwa Osama</i>	470
COMPARISON OF SKIN APPEARANCE WITH APPROPRIATE TIME IN SELF REFLEXOLOGY AREA WITH THAI TRADITIONAL MEDICINE IN GERIATRICS <i>Natsinee Sansuk</i>	471
PEER OBSERVATION AND SELF-MONITORING IN PRE-SERVICE TEACHERS’ MICROTEACHING <i>Wipada Prasansaph</i>	476
ESL STUDENTS’ EXPERIENCE OF PROJECT-BASED LEARNING <i>Abigail Melad Essien</i>	483
THE EFFICACY OF EXPLICIT INSTRUCTION ON IMPLICIT AND EXPLICIT KNOWLEDGE OF ENGLISH ARTICLES <i>Faten A. Alarjani</i>	489
TOPSIS METHOD TO SELECT LOCATION OF GRASS FLOWER IN WAREHOUSE <i>Martusorn Khangkhan</i>	509
ONLINE MARKETING IMPLEMENTED ON HIGHER EDUCATION IN THAILAND: A CASE OF INTERNATIONAL COLLEGE, SUAN SUNANDHA RAJABHAT UNIVERSITY <i>Nalin Simasathiansophon</i>	515
GUIDELINES FOR BUDDHIST ORGANISATION DEVELOPMENT IN THE PRESENT THAI SOCIETY <i>Cholvit Jearajit Ph.D</i>	523

# **SAFETY BEHAVIOR OF OPERATION STAFFS IN WATER PRODUCTION AND SUPPLY DEPARTMENT BANGKHEN WATER PLANT, BANGKOK, THAILAND**

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## **ABSTRACT**

Most of the accident happened because of the lack of safety precaution. The safety behavior is the main topic of this research. We focused on the operation staffs in water production and supply department, Bangkhen Water Plant, Metropolitan Waterworks Authority (MWA) Bangkok, Thailand. The population of 131 staffs were included. Data were collected by questionnaires in 2 parts, demographic data and 21 topics of safety behavior in 5 rating scale. There were 4 aspects of work including operation, equipment, environment and management. They were analysed in statistical parameters, comparing the safety behavior of the operation staffs by personal and working factors. Statistical t-test was used in case of 2 variables group and one-way ANOVA was used in case of more than 2 variables with the statistically significant level of 0.05. The questionnaires had

The demographic data showed 84% male and 16% female, half single and half marriage. Most of the population were less than 40 years old, 83.2% were bachelor degree and 62.6% had worked less than 10 years. The average monthly incomes of 15,001-30,000 baht were 53.4 percent. Most of them worked 8 hours a day and nearly half of the group, 43.9%, had over-time job.

The overview safety behavior of the operating staffs in water production and supply department of MWA was good. Considering in each aspect of the safety behavior on the operation, equipment and management were good. The working environmental factor was in the acceptable average. Sex, education, average income, working hour and over-time work were not statistically difference in safety behavior. The difference age group had difference safety behavior in the environmental aspect. The young had less score than the elder. Higher experience staffs who worked over 20 years had significantly better safety behavior compare to the new one and the couple had significantly higher safety behaviour than the single.

In conclusion, the staffs working in the field with chemical and mechanical equipment need to aware of safety by putting on the protection. The organization needs to strict to the safety procedure and rules. Addition study about the risk such as fatigue, working place, environment and equipment should be performed to reduce further incident.

**Keywords**--safety behavior, operation

## **INTRODUCTION**

Most of the cause of accident is unsafety behavior. The safety precaution is not belong to someone but anyone so we should pay attention to our safety behavior. We should build the safety culture in our social. All members should have their role in safety and risk precaution. The application of the safety behavior is important. It should be used in the real situation and maintain as a crucial part of practice to all staffs in the organization. The executive should enforce the safety practice to the daily activity and it will return by the

fluent of the job and profit. From 2006 to 2010, the incidence of working accident were increasing every years. The reported incidence of working related accident or illness in the Metropolitan Waterworks Authority (MWA) were 2 cases in 2015 and 1 case in 2016. All of them because of the lack of safety precaution or malpractice of prevention. By this course, we would like to study the safety behavior of the staff in water production and supply department in order to find out the cause and to prevent it.

The multiple factors theory of the safety engineering department, Kasetsart University mentioned about the cause of accident is multifactorial. The immediate cause may due to the unsafe behavior of the staff or in the unsafe situation. V. L. Gross had concluded the cause of working accident by 4M as

1. Man with the cofactor as sex, age, height, skill of work, training skill etc.
2. Media is the environment as weather, temperature, light and sound.
3. Management including the policy and rule of work
4. Machine or equipment including the size, shape and power source

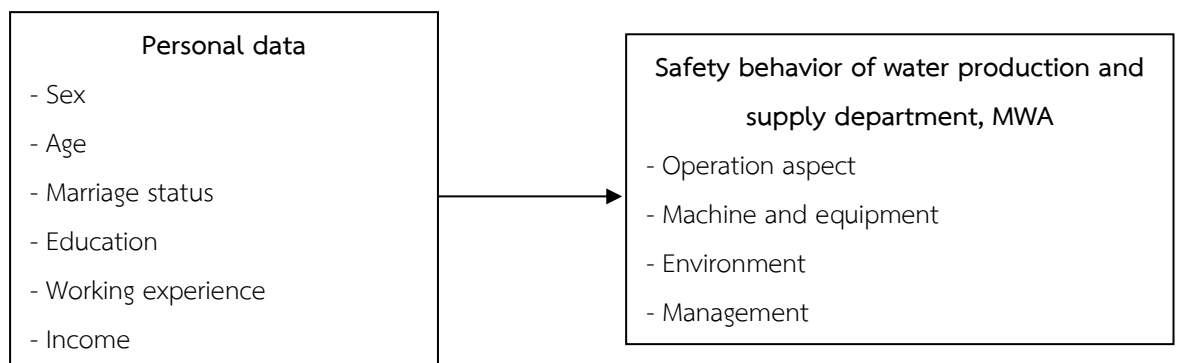
The multiple factors theory will be useful in analysis the cause of the accident and how to prevent them. Yoosook V, 1999 concluded the cause of the working accident in 2 main cause as

1. Unsafe act means the human act or practice cause unsafe to them and co-worker, lack of awareness of safety and without prevention.
2. Unsafe condition means environment and machine without good quality. It cause accident, injury or death. The improper working place without adequate light, noisy or improper chemical storage are the environmental part.

However, the human factor may involve such as fatigue and emotional stress.

Schulizinger said, there are over 250 proved factors involved in working accident. Most of them because of staff emotional factors followed their situations and external environmental factors.

Joseph Tiffin studied the incidence of working accident in 9,000 staffs of the mine and found that the younger age group had higher incidence and hospital admission. It is possible that the younger need to work directly with the higher risk job while the elder with more experience had less chance to expose the risk. And the couples had less accident than the single.



### **OBJECTIVE**

To study the safety behavior of staffs in water production and supply department, MWA.

### **METHODOLOGY**

This is a descriptive study in the population of 131 staffs in the water production and supply department, MWA. The data were collected by questionnaire including 3 parts as

1. Demographic data composed of sex, age, marriage status, education, experience and income
2. Questionnaire of 21 safety behaviors with 5-scale rating. The question had both positive and negative aspect.

<b>Positive</b>	<b>Score</b>	<b>Negative</b>	<b>Score</b>
Always	5	Always	1
Often	4	Often	2
Usually	3	Usually	3
Sometime	2	Sometime	4
Never	1	Never	5

We interpret the result by rating the safety behavior as excellent, good, fair, poor, very poor

The questionnaire was validated by

1. Content validity by 3 experts in content and language.
2. Reliability by using the validated questionnaire with the other plant.

Data was analyzed by statistical test as t - test and one-way ANOVA with the significant level of 0.05

## RESULTS

### Demographic data

**Table 1**  
**number and percentage of the staffs in water production and supply department, MWA**  
(N = 131)

<b>Demographic data</b>	<b>n</b>	<b>%</b>
<b>1. Sex</b>		
Male	110	83.9
Female	21	16.1
<b>2. Age</b>		
21 - 30 years	43	32.8
31 - 40 years	41	31.3
41 - 50 years	26	19.9
Over 50 years old	21	16.0
<b>3. Marriage status</b>		
Single	64	48.9
Married	67	51.1
<b>4. Education</b>		
Below Bachelor	3	2.3
Bachelor	109	83.2
Master	19	14.5
<b>5. Working experience</b>		
1 - 10 years	82	62.6
11 - 20 years	17	13.0
Over 20 years	32	24.4
<b>6. Monthly income</b>		
10,000 - 15,000 THB	22	16.8

Demographic data	n	%
15,001 - 30,000 THB	70	53.4
30,001 - 45,000 THB	15	11.5
45,000 - 60,000 THB	10	7.6
Over 60,000 THB	14	10.7

### Safety behavior

**Table 2**  
**Safety behavior of staffs in water production and supply department, MWA**

	Safety behavior	$\bar{x}$	S.D.	Evaluation
	<b>Operation</b>			
1	Follow the safety guide	3.93	.704	Good
2	Observe the working defect	3.87	.808	Good
3	Proper dressing	3.68	.922	Good
4	Talk with friends during on the machine	4.02	1.011	Good
5	Follow the step as trained	3.94	.820	Good
	<b>Total in Operation aspect</b>	<b>3.88</b>	<b>.573</b>	<b>Good</b>
	<b>Machine and equipment</b>			Good
6	Review the working process of the machine	3.63	.835	Good
7	Recheck the machine prior to start	3.95	.910	Good
8	Proper use	3.94	.811	Good
9	Proper storage after use	4.05	.758	Good
10	Use the equipment extra from the manual	2.91	1.085	Fair
	<b>Total in machine and equipment aspect</b>	<b>3.69</b>	<b>.6301</b>	<b>Good</b>
	<b>Environment</b>			
11	Clean environment	4.04	.637	Good
12	Chemical area	3.26	1.225	Fair
13	Improper ventilation	3.31	1.082	Fair
14	Working with machine	3.34	1.168	Fair
15	Inadequate light	2.98	1.095	Fair
	<b>Total in environmental aspect</b>	<b>3.38</b>	<b>.4595</b>	Fair
	<b>Management</b>			
16	Join the safety activity	3.73	.765	Good
17	Follow the safety instruction	4.04	.637	Good
18	Follow the safety signs	4.15	.634	Good

19	Support the college to follow the safety rules	4.14	.654	Good
20	Distribute the safety information to college	3.82	.836	Good
21	Safety suggestion or opinion to the organization	3.56	.954	Good
	<b>Total in management aspect</b>	<b>3.90</b>	<b>.56879</b>	<b>Good</b>

The table 2 showed the overview of the operation aspect in good level. The machine and equipment aspect in good level and the management aspect in good level, too. The environmental aspect showed the level fair except the topic working in the clean environment that was good.

**Table 3**  
**Comparing the safety behavior by sex**

Safety behavior	Sex	T - test for Equality of Means			
		$\bar{X}$	S.D.	t	Sig.
Safety behavior	Male	3.72	.39	.019	.985
	Female	3.72	.50		

This table showed no difference in safety behavior between sex.

**Table 4**  
**Safety behavior in discrete age group**

Age	$\bar{X}$	20 - 30 yr (3.24)	31 - 40 yr (3.51)	41 - 50 yr (3.37)	Over 50 yr (3.37)
20 - 30 yr	3.24	-	.275* (.006)	-.132 (.024)	-.229 (.058)
31 - 40 yr	3.51			.207 (.143)	.707 (.046)
41 - 50 yr	3.37			-	.462 (.097)
Over 50 yr	3.47				-

This table showed the middle age group had better safety behavior compare to the younger group.

**Table 5**  
**Comparing safety behavior by marriage group**

Safety behavior	Status	T - test for Equality of Means			
		$\bar{X}$	S.D.	t	Sig.
Safety behavior	Single	3.64	.39	-2.423	.017
	Married	3.80	.40		

The couple had better safety behavior than the single.

**Table 6**  
**Comparing between level of graduation**

Education	SS	df	MS	F	Sig.
Intergroup	.367	2	.183	1.129	.326
Intragroup	20.792	128	.162		
Total	21.159	130			

There is no statistically significant in the level of graduation.

**Table 7**  
**Comparing the safety behavior on the working experience**

Experience	$\bar{X}$	11 - 20 yr (3.53)	Over 20 yr (3.93)
1 - 10 yr	3.64	.112 (.499)	.283* (.030)
11 - 20 yr	3.53		.395* (.035)
Over 20 yr	3.93		-

This table showed the higher experience had better safety behavior than the new staffs.

### CONCLUSION

The studied population are 83.9% male and 16.1% female, half single and half marriage. Most of the population were less than 40 years old, 83.2% were bachelor degree and 62.6% had worked less than 10 years. The average monthly incomes of 15,001-30,000 baht were 53.4 percent. Most of them worked 8 hours a day and nearly half of the group, 43.9%, had over-time job.

The overview safety behavior of the operating staffs in water production and supply department of MWA was good. Considering in each aspect of the safety behavior on the operation, equipment and management were good. The working environmental factor was in the acceptable average. Since the organization has the safety regulation and continuous training, the overall results showed positive picture.

Sex, education, average income, working hour and over-time work were not statistically difference in safety behavior. The difference age group had difference safety behavior in the environmental aspect. The young had less score than the elder. Higher experience staffs who worked over 20 years had significantly better safety behavior compare to the new one and the couple had significantly higher safety behaviour than the single. These result related to the study of Arisara (2000) and Suppawat (2005) that these factors do not interfere the safety behavior.

In conclusion, the staffs working in the field with chemical and mechanical equipment need to aware of safety by putting on the protection. The organization needs to strict to the safety procedure and rules. Addition study about the risk such as fatigue, working place, environment and equipment should be performed to reduce further incident.

The staffs who work in the area of chemical and machine need to aware of the safety by putting on the proper suit and preventive equipment. The organization needs to strict to the safety rules with the punishment

to the out rule. Additional study about the tired, fatigue or working position may help to reduce the risk and working accident.

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