

국외 출장 결과보고 요약문

1. 목 적

- 독일 재해보험조합(DGUV)과 공동으로 추진하고 있는 글로벌 예방문화 평가지표 (Prevention Culture Indicator) 개발 관련 독일 측 공동연구 실무그룹과 그간 양측에서 실시된 연구결과 공유 및 향후 진행 방향에 관한 실무협의 등 추진

2. 출장개요

- 일 정 : '18. 12. 12(수)~12. 16(일) 【3박 5일】
- 출장국가 : 독일 드레스덴
- 출 장 자 : 2명
 - 산업안전보건연구원 전문직 4급 김경우
 - 산업안전보건교육원 전문직 4급 최윤석

3. 주요 수행사항

- 선행연구 등 주요 연구결과 발표 및 공유
- 신뢰(Trust) 선행지표 개발 위한 방법론적 접근방법 논의
- 최종 신뢰 예비요인(key factors)에 대한 공감대 형성
- 두 기관의 예비문항 비교분석 작업
- 신뢰(Trust) 개념적 정의 도출 및 향후 일정 논의 등

공단-DGUV간 공동연구 실무회의 참가 국외출장 결과

2018. 12. 12(수) ~ 12. 16(일)

순서

I. 출장개요	1
---------------	---

II. KOSHA-DGUV 예방문화 선행지표 공동연구 실무회의	3
------------------------------------------	---

1. 주요내용	3
2. 향후계획	7
3. 관련사진	8

III. 출장소감	9
-----------------	---

【별첨】

1-1. KOSHA 회의자료	11
1-2. KOSHA PPT 자료	54
2. DGUV 회의자료	65
3. Factor Matrix	89

I

출장개요

1. 목 적

- 독일 재해보험조합(DGUV)과 공동으로 추진하고 있는 글로벌 예방문화 선행지표(Prevention Culture Leading Indicator) 개발과 관련하여
 - 독일 측 공동연구 실무그룹과 그간 양측에서 실시된 연구결과를 공유하고 향후 진행 방향에 관한 실무협의 등 차질없는 연구추진을 위함

2. 출장개요

- 출장기간 : 2018. 12. 12(수) - 12. 16(일) [3박 5일]
- 출 장 지 : 독일 드레스덴
- 출 장 자
 - 연구원 안전보건정책연구실 정책제도연구부 전문직 4급 김경우
 - 교육원 교수실 건설경영교육부 전문직 4급 최윤석

3. 주요 수행사항

- 공동연구 진행상황 공유 및 협의
 - 선행연구 검토 결과 등 2018년(1년차) 주요 연구결과 발표 및 공유
 - 신뢰(Trust) 선행지표 개발 위한 방법론적 접근방법 논의
 - 최종 신뢰 예비요인(fre-factors)에 대한 공감대 형성
 - 두 기관의 예비문항 비교분석 작업
 - 산업안전보건의 신뢰에 대한 개념적 정의 초안 도출
- 향후 추진계획 협의
 - 2019년 전문가 워크숍, 현장설문조사 방법 및 공동연구 보고서 작성 방안 논의
 - 공동연구 결과발표 일정 논의 등

4. 일정요약

일 정	내 용
12.12(수)	<ul style="list-style-type: none"> ○ 출 국 - 인천공항 → 프랑크푸르트 → 드레스덴
12.13(목)	<ul style="list-style-type: none"> ○ 양 기관의 연구진행 결과 발표 및 공유 ○ 연구 접근방법 및 주요결과 비교 ○ 주요 결과에 대한 상호이해 도출
12.14(금)	<ul style="list-style-type: none"> ○ 1일차 회의 결과에 대한 검토 ○ 예비문항 통합 위한 비교검토 작업 ○ 신뢰(Trust) 개념적 정의 도출 ○ 향후 일정 논의
12.15(토)~16(일)	<ul style="list-style-type: none"> ○ 귀 국 - 드레스덴 → 뮌헨 → 인천공항

II KOSHA-DGUV 예방문화 선행지표 공동연구 실무회의

1 주요내용

☐ 일 자 : 2018. 12. 13(목) ~ 12. 14(금)

☐ 장 소 : 독일재해보험조합(DGUV) 교육원(IAG)(독일 드레스덴)

☐ 주요참석자

- 공단 : 김경우 연구원, 최윤석 과장
- DGUV IAG : Dr. Ulrike Bollmann
- WissensImpuls : Robert Gründler(DGUV의 외부 용역연구기관)

☐ 주요 논의결과

- 두 기관의 2018년(1년차) 주요 연구결과 발표
 - KOSHA : 문헌연구 결과 및 이를 바탕으로 구성한 신뢰의 조작적 정의 및 예비요인, 파일럿 스터디(pilot study) 성격의 대한민국 근로자들을 대상으로 수행한 예비 요인분석 결과 및 준거타당도 결과 공유 (별첨 1-1~2. KOSHA 회의자료 및 PPT)
 - DGUV : 그간 진행된 문헌 연구의 주요 결과 및 최종 도출된 5가지 예비요인의 정의와 각 하위요인에 대한 설명(별첨 2. DGUV 회의자료)
- 신뢰 선행지표 개발을 위한 방법론적 접근 방법 논의
 - DGUV는 질적인 접근을 우선으로 하는 Top-Down 방식을 통해, 신뢰와 관련 하위요인에 대한 정의를 우선 정리하고, 이후 양적인 접근 방법(현장 조사 등을 통한 통계적 접근)을 주장

- KOSHA는 질적인 접근도 중요하나, 이미 1년간 문헌리뷰 과정을 통한 질적인 접근을 수행했었고 이를 기반으로 신뢰의 조작적 정의(초안)와 각 요인별 정의(초안)를 정리한 상태이니, 빠른 시일 내 전문가 워크숍을 마치고 현장조사(양적인 접근)를 수행, 그 결과를 토대로 질적인 접근 결과와의 일치 여부 및 불일치 부분에 대한 보완점을 찾는 Bottom-up 방식의 연구를 진행하는 것이 좋을 것 같다는 의견을 주장
- 지표개발의 방법론에 있어서는 당연히 병행되어야 할 2가지 기본적인 방법론들이므로, 우선 질적인 접근에 조금 더 시간을 할애하여 진행하기로 협의함
- 이를 위해 현재 정리되어 있는 신뢰의 조작적 정의와 각 요인별 정의를 다시 점검하고, 구성된 최종 예비문항에 대해서는 전문가 회의(2019년 상반기 예상)를 통해 추가 의견을 반영하기로 함

○ 최종 신뢰 예비 요인에 대한 공감대 형성

- DGUV는 시스템(system/process), 행동(behavior), 가치(value/attitude)의 3가지 기준에 기반하여 Coopertaion, Predictability, Competence, Care, Fairness로 구성된 예비 요인을 제안함. 각 요인을 구성하는 예비문항은 현재 상당히 개괄적인 수준이나, Accident, Health, Well-being을 아우르는 내용으로 구성하고 있음
- 이에 반해, KOSHA는 선행연구에서 신뢰와 관련되는 문항들을 추출하고, 이를 통해 Care, Cooperation, Justice, Predictability, Trust로 구성된 5가지 요인 및 예비문항을 제안함. 각 문항은 선행연구에 근거하여 안전보건 분야에 맞게 수정되었으므로 문항의 내용이 상당히 구체적이거나, 그 대상(조직, 관리자, 근로자 등)이 혼재되어 있는 상황이며 Accident 중심으로 구성되어 있음
- 양 기관에서 고려하고 있는 예비요인의 상당부분이 이미 일치하고

있음. KOSHA의 Justice 요인이 Fairness와, Trust 요인이 Competence와 의미상 유사하므로 토론 끝에 최종 5가지 예비 요인으로 Cooperation, Care, Fairness, Competence, Predictability을 확정하기로 함

○ 두 기관의 예비문항 비교 분석 작업

- 제안된 두 기관의 세부 예비문항을 검토하고, 하나로 정리하는 작업을 수행 함
- 금번 회의에서는 “Cooperation” 요인을 중심으로 연구의 주요 프레임(Relational & Functional / System & Behavior & Value)에 맞춰 각 기관의 개별 문항을 비교하여 분류하는 작업을 함
- 시간 관계상 나머지 4개의 요인에 대해서는 각 기관에서 비교분류 작업을 마무리하고, 메일을 통해 서로의 결과를 검토하기로 함 (별첨 3. Factor Matrix)

○ 신뢰의 개념적 정의 도출

- 이상의 예비요인 및 연구 프레임을 반영할 수 있는 개념적 정의를 도출하기 위한 공동 논의를 진행함
- 그 결과, 다음과 같은 신뢰의 개념적 정의(초안)를 정리함
 - Trust refers to positive expectations about others. Trust is based on beliefs but also on intentions to act. It can be differentiated between two fundamental types of trust: functional trust (explicit; looking for reasons to trust) and relational trust (implicit; based on benevolence). Determining factors of trust are: cooperation, predictability, competence, care and fairness. Trust has a positive effect on safety and health at work. (향후 변경 가능)

○ 주요 진행 사항 논의

· 2019년 전문가 워크숍

- 모든 전문가가 한 자리에 모이기가 어려운 현실적인 에로사항을 감안하여, 각 나라에서 전문가들과 함께 개별 워크숍 개최 방안도 논의 하였으나,
- 최종적으로는 본 연구에 기여할 수 있는 핵심 전문가(5인 내외)와 함께 공동 전문가 워크숍을 개최하는 방안으로 정리함
[가능한 2019년 상반기(4~5월정) 이내 개최]

※ 신뢰 예비요인 catalog 및 예비문항 구성 이후 사업장 인터뷰 및 전문가 워크숍을 통해 최종 예비문항 확정을 목표

· 2019년 ~ 2020년 공동연구 결과 발표 일정 논의

- 2019년 10th International Conference on the Prevention of Accidents at Work(오스트리아) 또는 2020년 World Congress on Safety and Health at Work(캐나다)
- 현재 2019년 관련 학회 발표(또는 공동 발표) 참여를 확답할 수는 없으나, 2020년 경에는 유의미한 결과물과 함께 공동 발표를 할 수 있도록 하는 방향으로 정리함

· 2019년 현장 설문조사 방법 논의

- 양적인 접근 방법의 일환으로 현장 조사는 반드시 진행이 되어야 하나, 구체적인 대상 사업장 선정 및 섭외 문제, 설문조사 방법 등은 전문가 워크숍 개최 시점에 예비문항 개발 상황을 모니터링 하면서 함께 검토하기로 함

• 공동 연구보고서 작성 방법 논의

- KOSHA는 내부 절차의 일환으로 매년 연구보고서가 작성되어야 하나 DGUV의 경우, 내부 연구보고서를 작성할 필요는 없으며 학술지(저널) 논문 제출으로 갈음이 가능함
- 향후 최종 공동 논문을 제출하기 위한 절차의 일환으로 미리 연구 내용을 정리하는 부분에는 상호 공감하나, 저널에 따라 투고 형식이 달라지는 등의 현실적인 문제가 있음
- 우선, KOSHA에서는 매년 내부 연구보고서를 작성하고, 도움이 필요시 DGUV도 적극 협조해주기로 함

2 향후계획

☐ 최종 예비문항(안) 확정 작업

- 2019년 1월 중에 Factor matrix 정리 작업을 통해 양 기관의 예비 문항 비교 작업을 마무리
- 문항 최종 검토 및 전문가 워크숍 계획 수립

☐ 전문가 워크숍 및 현장 설문조사 방법론 검토

- 질적인 측면에서 예비문항 구성에 도움이 되는 핵심 전문가 4~5명 선정(한국 & 독일)
- 1~2일 이내 집중 워크숍을 통해 최종 예비문항 확정
- 두 나라의 현장 설문조사 방법을 함께 논의

☐ 2019년 KOSHA(내부) 자체 연구과제 확정

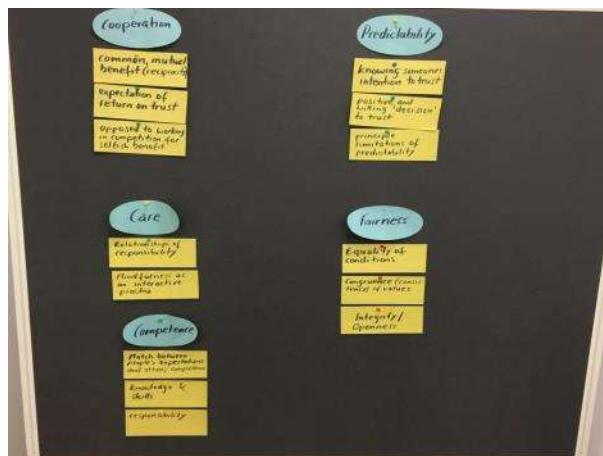
- 연구제목: 예방문화 선행지표 개발을 위한 한국-독일 공동연구(2년차)

3 관련사진

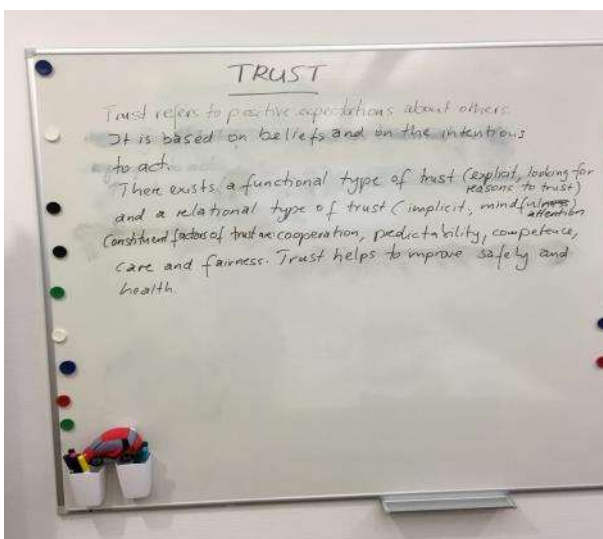
주요 연구결과 발표



신뢰(Trust) 예비요인(Key factors) 및 예비문항 비교 분석 토론



신뢰(Trust) 개념적 정의 도출



III

출장소감

□ 양 기관의 지표개발을 위한 방법론적 접근방법 협의

- DGUV는 질적인(정성적) 접근을 우선으로 하는 Top-down 방식으로 신뢰와 관련 하위요인에 대한 정의(definition) 중심의 연구 진행하였으며,
- 공단의 경우 문헌리뷰 등을 통한 질적 접근을 기 수행하였으므로 전문가 워크숍을 통한 문항검토 및 현장조사(설문)를 중심으로 통계분석을 통한 Bottom-up 방식의 연구를 진행할 것을 제안함
- 지표개발에 있어서 모두 필요한 방법이므로, 우선은 질적 접근에 시간을 더 할애하여 진행하기로 협의

□ 신뢰(Trust) 하위요인 및 개념적 정의에 대한 합의(안) 도출

- KOSHA와 DGUV 두 기관은 신뢰(Trust) 요인에 대한 문헌검토(Literature review)를 개별적으로 검토 수행하고 최종 거의 유사한 5가지 신뢰요인을 제안함
 - DGUV: Cooperation, Predictability, Competence, Care, Fairness
 - 공단: Cooperation, Predictability, Trust, Care, Justice
- 두 기관의 비슷한 예비요인(Trust vs Competence, Fairness vs Justice)에 대한 토론 후에 최종 5가지 예비요인을 확정함
- 합의된 신뢰의 하위요인(5가지 요인) 및 예방문화 등이 반영된 신뢰의 개념적 정의 완성(초안)

□ 공동전문가 워크숍을 통한 전문가 검토 필요성 공감

- 핵심전문가(5인 내외) 중심의 공동 전문가 워크숍 '19년 상반기 내 개최하기로 협의

□ 공동연구 수행에 따른 양기관의 공감대 재형성

- 지역(아시아/유럽)이 분리되어 있는 제한점에도 불구하고 지난 1년간 E-mail(수차례)과 연구회의(2회)를 통해 지속적으로 연구를 진행해 왔음.
- 특히, 금번 연구회의(3회차)를 통해 1년간의 연구결과를 상호 공유·공감하고, 앞으로 나가갈 2년차 연구 방향, 그리고 본 공동연구가 가지는 의미에 대해 상호간의 공감대를 다시 한 번 확인하고 재정립했다는 부분에 가장 큰 의의를 가질 수 있음.

IV 선물수령 및 신고여부

수령 여부	신고 여부	비고
(×)	(×)	

※ 10만원(미화 100달러)이상 이거나 시장가액을 알 수 없는 선물 수령 시 지체없이 감사실에 신고

<Meeting Schedule>



KOSHA-DGUV Follow up project on

"Trust as a leading indicator for a culture of prevention"

Meeting Schedule in Dresden, 13 – 14 December 2018

Participants: Kim Kyungwoo; Choi Yoon Seok; Bollmann Ulrike; Gründler Robert

Date	Time	Contents (with examples)	Note
13/12	13:00~15:00	<ul style="list-style-type: none"> The progress of research in this year <ul style="list-style-type: none"> DGUV KOSHA Comparison of research approach and outcome Agreement on the outcome for the Dresden Meeting 	We shall spend some time on analyzing the commonalities and differences between our organizations' approach to research
	15:00~17:00	<ul style="list-style-type: none"> Clarification of our understanding of trust <ul style="list-style-type: none"> Operational definition of trust in OSH Trust framework Clarification of the relationship between trust and OSH Comparison of trust factors in each organization Work on a common understanding of each trust factor 	We shall spend some time on a proper understanding of each trust factor
14/12	09:00~12:00	<ul style="list-style-type: none"> Reflection on the outcome of day one Work on common draft items based on the draft items of each organization 	
	13:00~approx. 16:00	<ul style="list-style-type: none"> Self-evaluation of the draft items Next steps <ul style="list-style-type: none"> How to contact the workplace Survey method International expert meeting How to analysis the data How to write the research report When we need to meet again Miscellaneous 	That's a great idea. We can do it either per organization or in mixed groups and may be distributing the factors between us.

Progress of Research by KOSHA in 2018

1. Literature Review

□ The background of trust research

- The study of trust has attracted attention in various disciplines such as business administration, sociology, psychology, economics, etc. Especially, it has been regarded as social capital and also has been studied in political field and public administration.
- However, trust has a kind of tendency to take a psychological approach as an abstraction (constructive) concept (especially, organizational behavior and organizational theory).

□ Existing definition for trust in general

- To define the constructive concept of trust and to develop an indicator, the researchers of KOSHA have looked at the general definitions of trust within the organization through literature review.
- Classification by individual, behavioral, and psychological perspectives
- Individual (personality) perspective: It was conceptualized trust as a stable and persistent personality trait formed through the early experiences of life. In this perspective, the concept of trust is divided into dispositional trust and generalized expectation.
 - Behavioral perspective: It is defined by mutual beliefs that occur when another person shows faithful behavior as a kind of external behavior.
 - Psychological perspective: It is defined as a willingness to take risks and to believe in others for cooperation even if there is uncertainty based on positive expectations about the other's actions and attributes.
- Multidimensional Perspective
 - McAllister(1995): Affect-based trust / Cognitive-based trust
 - Lewicki & Bunker(1995): Calculus-based trust / Knowledge-based trust
 - Rousseau et al.(1998): Deterrence-based trust / Rational-based trust / Institution-based trust
- The main concept of trust in the context of organization
 - Mayer et al.(1995): Regardless individual can monitor or control the other, the willingness to accept vulnerabilities of someone based on the expectation that someone will do certain actions that are important to me.
 - Heimer(2001): To believe that others will not bring harmful consequences to their interests in a risky situation in connection with my interests and trust their own interests to others.
 - Rousseau et al.(1998): A psychological state that includes an intention to accommodate vulnerabilities based on positive expectations of another's intention or behavior. These definition has two aspects like intention and belief. => 1) The ascendant factor of trust can be

reflected a set of 'beliefs' of trustee 2) Trusting actions can be reflected the 'intention' to accommodate vulnerability.

- It is based on the interest. / vulnerability, uncertainty. / Trustee do not opportunism behavior due to influence of trustor.
- The combination of interests, dependency situations, and commitments that correspond to both personal judgment, the nature of the relationship, and the social and structural characteristics.

○ Trust relationship or trust process

- Providing trust to the trustee is related to give up the control of trustor to trustee, although the trustee may act in a negative manner and may be harmful effect to trustor.
- Trustor's willingness to accept vulnerabilities in trust relationships is known to evolve into positive expectations for Trustee.
- Trustworthiness
 - The quality of trustworthiness can be divided by ability, integrity, benevolence(Mayer et al., 1995).
 - ability: Ability is about the capability to safely accomplish tasks and roles.
 - integrity: the openness and honesty involved consistency with safety value and safety behavior.
 - benevolence: Pay attention to ensuring the welfare and safety of others.(Colquitt et al., 2007)
 - Positive expectations in the above three concept sets can be an important role. Commitment, sharing, and engagement can be also increased, when there is positive expectation.
- The redefinition and factors of trust
 - Key factors affecting trust in the relationship between Trustor and Trustee
 - Trustee to Trustor: consistency, responsibility, protection, honesty and openness, benevolence
 - Trustor to Trustee: Performance competence, consistency, responsibility, honesty and openness
 - Synergistic Factor: shared responsibility, reciprocal relationships, predictable positive expectations, good faith
 - Relationship between trust and trustworthiness
 - trust: Positive perception of the other party and intention to take vulnerability to the other party (key factor)
 - trustworthiness : the characteristics of the other party that influence the construction of the other's positive perception(ability, reciprocal relationships, integrity, openness etc)
 - Discuss whether trustworthiness is a kind of concept of trust or an ascendant factor (different by scholar)
 - Recently, the argument that trustworthiness should be regarded as a leading factor of trust is being persuaded; As a result of meta-studies, a simple positive perception of the other party's affiliation is possible without risk. The intention to expose the vulnerability to the other party is

different.

- The relationship between trust and distrust
- The factors based on organizational trust
 - Hart, Capps, Cangemi & Cailouet(1986): Openness, consistency, sharing organizational value, autonomy
 - Mishra & Morrissey(1990): Open communication, participation in decision making, sharing important information, sympathy
 - Levering(2000): Integrity, individual respect, fairness, pride, fun
 - Lee(2003): procedural justice, organizational capacity, recognition and growth opportunities, consideration, morality, fairness of distribution, social contribution (Korean workers)
 - Lim(2004): Self-esteem, organizational atmosphere, personnel fairness, executive capacity, and care of workers (Korean workers)
- The main feature of trust
 - Dynamics: increase or decrease depending on time
 - Irrelevance: difficulty in recovering if it is withdrawn
 - Transactional: Exchange various types of resources
 - Mutuality: existence of trustor and trustee
 - Emotional effect: sometimes it is unconditional (blind) so when trust is broken, emotional impact and wounds can be affected.
 - Implicit: action based on mutual consent, even if not explicitly expressed

2. Open-Ended Questionnaire

□ Participants

- 141 person who are 48 safety and health manager, 80 common employees, 13 employees of safety and health private organization. (Survey: April ~ August, 2018)

Variable	Factors	responded number
Trust	Rule compliance	21
	Communication	21
	Mutual trust	19
	Leadership	17
	Safety work environment	14
	Belief	13
	Respect	9
	Education	9
	Trust between manager and worker	7
	Appointment	6
Prevention	Prevention activity in advance	47
	Education	46
	Process compliance	14
	Risk perception	13
	Safety condition	13
	sharing and interest	12
	Life respect	11
	Work environment management	10

□ Example of impressive responses (centered on key words) related to Trust

- (Rule compliance) Keep the regulation, process, order, principle
- (Communication) Relationship with employer-employee (containing Labor union), talking for everything (feedback, mutual communication, communication for organizational level, not hiding)
- (Mutual trust) personal-personal, personal-manager- organization(management), belief itself, understanding, no doubt
- (Leadership) willingness of leader, communication, belief for leader, safety competency of leader, investment and policy from leader
- (Safety work environment) Safety for equipment, heavy machine, safety protection tool, inspection for all environment
- (Belief) cooperation with colleague, care, organizational culture based on love, human relationship, belief for no occurring accident

3. Operational Definition for trust in OSH

□ Process for developing “Trust leading indicator”

- The concept of trust in occupational safety and health
 - First of all, in order to develop leading indicator of trust in occupational safety and health, it is necessary to define the constructive concept of trust and to make an operational definition that can measure trust based on construct concept.
 - Making a questionnaire or an indicator is a kind of standard procedure to collect a set of some behaviors or thoughts in particular area(Crocker & Algina, 1986). So in order to develop an indicator of trust, it is necessary to determine what representative behaviors or thoughts are.
 - In other words, it is necessary to start the development of an indicator with a conceptual definition of trust through descriptive definition and operational definition of the constructive concept of trust in occupational safety and health.
- The constructive concept for trust in OHP
 - Making the definition of the constructive concept can be possible through existing literature review, interviews, open-ended questionnaire, or even direct observation.
 - In this study, we attempted to establish a draft of constructive concept based on Open-ended questionnaire with Korean workers and the results of literature review.
- If we look at the above contents, trust in the perspective of preventive culture and OSH needs to be narrowed down to a few key points.
 - Concept of trust in the perspective of OSH based on the concept of preventive culture
 - Trust that the safety-related behavioral characteristics can be reflected from the psychosocial perspective of individuals and organizations
 - Trust should be able to tolerate the vulnerability of the other party, but it is based on the positive trustworthiness of the other party's ability, information, belief etc. for prevention of accidents.
 - Trust that can be reflected in mutual trust in communication, leadership, safety and health environment, which should be treated as important in industrial safety and health,
- Considering the above, KOSHA would like to suggest the operational definition of trust in OSH as follows.
 - (Korean) 산업안전 보건에서 신뢰란, 개인과 조직이 서로의 불완전성을 수용하면서 근로자와 그들의 가족, 그리고 공동체에 작업환경의 부정적인 영향이 미치지 않도록 안전하고 건강한 근로 환경을 개발, 유지하고자 노력할 것이라는 의식적이고 압축적 믿음으로 정의한다.

- (English) As a sub-factor of preventive culture, trust in industrial health & safety is defined as the conscious and implicit mutual belief that individuals and organizations taking into account vulnerability of each other will strive for developing and maintaining a safe and healthy work environment for all workers – not only to protect the workers themselves from accident and illness but to prevent negative effects in the work environment from affecting their families and communities.
- o Trust in occupational safety and health as described above will help to establish a positive mutual interest that can contribute to workers' safety and health commitment and increase safety behavior and ultimately contribute to the prevention of industrial accident and disease.

4. Draft items by KOSHA

□ The first draft factors by KOSHA

The opinion of DGUY	The opinion of KOSHA
Reliance Confidence Competence Cooperation Reciprocity Predictability Consistency Expectation Care Fairness Sharing Transparency Goodwill	Factor 1(ex.) : Reliance, Confidence, Competency + leadership Factor 2(ex.) : Cooperation, Reciprocity + communication Factor 3(ex.) : Predictability, Consistency, Expectation + Safety work environment Factor 4(ex.) : Care, Sharing, Goodwill + Belief Factor 5(ex.) : Fairness, Transparency + mutual trust

Blue one is the factor from Open-ended questionnaire

- It seems to be more efficient to reduce factors with similar factors.
- It is necessary to reflect the contents of Open-ended questionnaire.

□ Final expected factor classification with KOSHA opinion(idea)

- Definition of prevention culture and safety culture
- The key factors from literature review
- the realistic of OSH such as Open-ended questionnaire
- Based on the operational definition of trust above, the following pre-draft items were constructed focusing on the main factors of the open-ended question and literature review.
 - Content that can reflect the operational definition of trust.
 - Construct items to investigate factors that may affect trust and safety and health (communication, leadership, etc.) and the consequences (such as worker safety behaviors, work environment improvement, accident prevention) on a single scale. (The reason for putting the result variable is helpful to analyze the relationship of the ascendant factor and the consequence factor.)

5. Pre-factorial analysis with draft items of KOSHA

□ Final draft items by KOSHA(September, 2018)

○ Black one: revised Korean version / Blue one: revised English version / Red one: Original English version that was shared by Email on last September at first

No	Draft items	Factor
1	우리 조직은 안전/보건과 관련된 중요한 의사결정을 할 때 구성원들의 의견, 요구를 고려한다. Our organization considers the opinions and needs of its members when making important safety and health decisions. (The organization considers the opinions and needs of its members when making important safety and health decisions.)	Care
2	우리 조직 구성원들은 함께 근무했던 직원이 더 이상 함께 일하지 못하게 되면 모두 상실감을 경험할 것이다. If the employees who have worked together can no longer work together, all will experience a sense of loss. (If the employees who worked together can no longer work together, all will experience a sense of loss.)	Care
3	우리 조직 구성원들은 안전/보건과 관련된 어떠한 문제를 공유할 때 서로 지지하는 모습을 보여줄 것이다. Our members of organization will show a supportive responses when some safety and health related issues can be shared with them. (The members of organization will show constructive and supportive responses when they share any safety and health related issues.)	Care
4	우리 조직 구성원들은 안전/보건과 관련된 제안이나 문제를 경청한다. Members of organization listen carefully to suggestions or issues related to safety and health. (The members of organization listen carefully for suggestions or issues related to safety and health.)	Care
5	우리 조직의 경영진들은 직원들의 관점에서 안전/보건과 관련된 일을 진행하려고 한다. Management of our organization seeks to do safety and health work from the perspective of employees. (Management seeks to do safety and health work from the perspective of employees.)	Care
6	우리 조직의 경영진들은 안전/보건과 관련된 사안에 대해 직원들을 도와줄 수 있는 방법을 찾기 위해 노력한다. Management of our organization tries to find out the ways to help employees issues for safety and health. (Management strive to find ways to help employees with safety and health issues.)	Care
7	우리 조직 구성원들은 안전/보건 사항과 관련하여 서로를 진심으로 배려한다. Members of our organization seriously take care of each other related to safety and health issues. (The members of organization take a serious look at the safety and health aspects of their employees.)	Care

No	Draft items	Factor
8	우리 조직의 관리자들은 안전/보건 관리에 있어 충분한 능력과 기술을 가지고 있다. Managers of our organization have sufficient abilities and skills in safety and health management. (The managers of organization have sufficient abilities and skills in safety and health management.)	Trust(Competence)
9	나는 우리 조직의 안전/보건 관리 기술에 대한 긍정적 믿음을 가지고 있다. I have a positive belief in the organization's safety and health management skills. (I have confidence in the organization's safety and health management skills.)	Trust(Competence)
10	우리 조직의 구성원들은 안전하게 일할 수 있는 능력이 있다. Members of our organization have the ability to keep the safe work. (The members of organization have the ability to work safely.)	Trust(Competence)
11	우리 조직의 구성원들은 업무 경험을 통해 사고를 예방할 수 있는 방법을 지속적으로 학습한다. Members of our organization continually learn the way to prevent accidents through their work experience. (Members of organization learn through experience how to prevent accidents.)	Trust(Competence)
12	우리 조직의 안전/보건 관리자가 행하는 현장 점검이나 평가는 안전/보건 개선과 사고 예방에 긍정적인 영향을 미친다. On-site inspection and evaluation done by the safety and health manager has positive effects on safety and health improvement and prevention of accidents. (Original: On-site inspection and evaluation by the safety and health manager has positive effects on safety and health improvement.)	Trust(Competence)
13	우리 조직의 구성원들은 안전/보건 관련 교육과 훈련이 긍정적인 효과가 있다고 생각한다. Members of our organization think that safety and health education and training have a positive effects. (The members of organization think that safety and health education and training have positive effects.)	Trust(Competence)
14	우리 조직의 신입사원 선발 과정에는 안전/보건 관련 지식과 태도를 평가하는 절차가 있다. Our organization have a process to evaluate safety and health knowledge and attitudes of a new employee in the selection process. (The selection process for new employee in organization contained a process to evaluate safety and health knowledge and attitudes.)	Trust(Competence)
15	우리 조직은 신입사원이 안전하고 건강하게 근무할 수 있도록 체계적인 훈련과 교육을 제공하고 있다. Our organization provides systematic training and education for new employees to help safety and health work. (The organization provides systematic training and education for new employees to work safely and healthily.)	Trust(Competence)
16	나는 조직 내 다른 구성원들의 업무상 부주의로 인해 나의 안전/보건이 위협받고 있다고 생각한다. I think that my work is threaten by the inattentive work of other colleagues. (I believe that my work will not become more dangerous because of the inattentive work of	Trust(Competence)

No	Draft items	Factor
	other colleagues.)	
17	우리 조직의 구성원들은 안전/보건과 관련된 목표를 달성하는데 기여를 하고 있다. Members of our organization contribute to the achievement of the organization's safety and health goals. (The members of organization contribute to the achievement of the organization's safety and health goals.)	Trust(Competence)
18	우리 조직의 구성원들이 안전하게 작업을 수행하는 것에 매우 익숙하다. Members of our organization are very good at doing safety work. (The Members of organization are very skilled at working safely.)	Trust(Competence)
19	우리 조직 구성원들은 안전/보건에 대한 명확한 목표의식이 있다. Members of our organization have a clear sense of purpose for safety and health. (I think it is important to have clear goals for safety to employees working in the organization.)	Trust(Confidence)
20	우리 조직의 경영진은 안전/보건과 관련된 명확한 방향성을 제시한다. Management of our organization presents a clear direction for safety and health. (The management of organization has a clear direction on safety and health.)	Trust(Confidence)
21	우리 조직은 직원들이 합의한 안전/보건 관련 사안들을 실현할 수 있는 효과적인 제도가 있다. Our organization has an effective system to realize the safety and health issues agreed by our employees. (An effective system in which employees can agree on safety and health issues and can be realized is existed in organization.)	Trust(Confidence)
22	우리 조직은 직원들에게 안전/보건과 관련된 정보를 제공하는 피드백 제도를 갖추고 있다. Our organization has a feedback system that provides safety and health information to employees. (The organization has a feedback system that provides safety and health information to employees.)	Trust(Confidence)
23	나는 조직 내 다른 구성원들과 협업하는 경우 안전/보건과 관련된 문제가 발생할 것을 걱정하지 않는다. I do not worry about occurring safety and health problems when I try to cooperate with other colleague in organization.. (If I need to work with new employees, I do not worry about occurring safety and health problems.)	Trust(Confidence)
24	우리 조직의 구성원들은 안전/보건 사안과 관련하여 자신이 말한 대로 행동한다. Members of our organization behave as they say about safety and health issues. (The members of organization act as they say about safety and health issues.)	Predictability
25	우리 조직의 경영진들은 안전/보건관련 사안들에 대한 약속을 지킨다. Management keep the appointment related to safety and health issues. (Management keep the appointment to safety and health issues.)	Predictability
26	우리 조직의 구성원들은 안전/보건 관련 사안이 정해지면 이를 준수하고 따른다. Members of our organization comply with and follow the safety and health rule when it sets as a new.	Predictability

No	Draft items	Factor
	(The members of organization will comply with safety and health rule when it set as a new.)	
27	우리 조직의 구성원들은 어떤 상황에서도 안전/보건과 관련된 사안을 우선시 한다. Members of our organization prioritize the safety and health issue under any circumstance. (Whenever the members of organization are treated in safety and health issue, this is always top priority.)	Predictability
28	우리 조직의 직원들은 누군가 안전 문제를 지적한다면 이에 대한 해결책을 찾으려고 함께 노력한다. Members of our organization try to find out a solution if someone points out a safety issue. (Employees working in organization try to find a solution if someone points out a safety issue.)	Cooperation
29	우리 경영진들은 더 나은 안전/보건 환경을 만들기 위해 투자를 아끼지 않는다. Our Managements do not hesitate the investment to build a better safety and health environment. (Managements have invested a lot in building a better safety and health environment.)	Cooperation
30	우리 조직 구성원들은 동료의 안전/보건과 관련한 도움이 필요할 때 기꺼이 도울 것이다. Members of our organization will help their colleague when their colleague need some help related to the safety and health. (Those who work with me will help me when I need it in safety and health.)	Cooperation
31	우리 경영진들은 조직의 재정적 이득보다 직원들의 안전/보건과 관련된 사항을 우선시한다고 생각한다. The best priority of our Managements is the safety and health issue than the profit of organization. (I think that the safety and health of the employees is the highest priority than the profit of the organization.)	Cooperation
32	나의 안전/보건의 문제가 우리 조직의 안전/보건과 연결되어 있다고 느낀다. I feel my safety and health issue is connected to the safety and health issue of the organization. (I feel my safety and health issue is connected to the safety and health issue of the organization.)	Cooperation
33	우리 조직은 안전/보건 문제를 상호 협력하여 해결할 수 있는 문화가 구축되어 있다. Our organization has built a culture to solve the safety and health issues through a cooperation with each other. (The organization has a culture in which the safety and health issues can be solved in cooperation.)	Cooperation
34	동료들과 함께 일하기 때문에 안전/보건 목표를 더 효과적으로 성취할 수 있다. By working with colleagues, I can achieve our safety and health goals more effectively. (Working with colleagues at this moment can help me achieve our safety and health goals more effectively.)	Cooperation
35	우리 조직은 안전/보건과 관련된 상호 기대에 부응하고 있다고 생각한다. I think that our organizations respond to mutual expectation related to the safety and health. (I believe that organizations will meet my safety and health expectations.)	Predictability

No	Draft items	Factor
36	나와 내 동료들은 안전을 지키는데 있어 관리자들이 도움을 줄 것으로 기대한다. I and my colleagues expect that managers give a help to keep our safety. (I and my colleagues expect that managers will help to keep our safe.)	Predictability
37	나와 내 동료들은 안전/보건에 대한 노력을 한다면, 보상을 받을 수 있을 것으로 기대한다. I and my colleagues expect to be rewarded if they make effort for the safety and health. (I and my colleagues expect to be rewarded for our safety and health efforts.)	Predictability
38	나와 내 동료들은 안전/보건에 대한 노력을 한다면, 인정을 받을 수 있을 것으로 기대한다. I and my colleagues expect to be credited if they make effort for the safety and health. (I and my colleagues expect to be recognized for their safety and health efforts.)	Predictability
39	우리 조직 구성원들은 우리 조직의 안전/보건에 대한 일관된 믿음을 가지고 있다. Member of our organization have an undoubted belief for the safety and health. (I think this organization will keep its appointment to safety and health.)	Predictability
40	우리 조직은 직원들의 안전/보건을 관리하는 데 있어 공정하기 위해 노력하고 있다. The organization tries to commit to fairness in managing the safety and health of employees. (The organization is very committed to fairness in managing the safety and health for employees.)	Justice
41	우리 조직은 구성원의 지위고하를 막론하고 일관된 안전/보건 규정을 적용한다. Our organization applies the consistent safety and health regulations regardless of the status of its members. (The organization applies the same safety and health rules to all employees.)	Justice
42	우리 조직은 안전/보건에 대한 의사 결정을 할 때 구성원들의 의견을 반영한다. Our organization reflect an opinions of its members when making safety and health decisions. (The organization also includes employees' opinions when making safety and health decisions.)	Justice
43	나는 관리자들의 안전 관리 방식이 합당하다고 믿는다. I believe that the way of safety management of managers is reasonable. (I believe that the way managers handle safety is fair.)	Justice
44	경영진의 결정과 행동은 안전/보건에 대한 올바른 원칙에 기반하고 있다. Decisions and actions of management are based on the right principles of safety and health. (Management decisions and actions are based on the right principles of safety and health.)	Trust(Reliance)
45	경영진의 안전/보건에 대한 정책의 의도와 동기가 선하다고 생각한다. I think that safety and health policy intention and motivation of management are good. (I think that management's safety and health policy intention and motivation are good.)	Care
46	나는 안전/보건에 관한 관리자의 피드백을 긍정적으로 받아들인다. I positively accept a feedback of manager related to safety and health. (If the manager gives positive feedback on safety and health, I accept that feedback.)	Care
47	내가 안전/보건 사안에 대해 실수하더라도 주변 동료들과 관리자들은	Care

No	Draft items	Factor
	비난하기보다, 나를 걱정할 것이다. If I make a mistake about safety and health issues, colleagues and managers worry about me rather than blame. (If I make a mistake about safety and health issues, colleagues and managers will forgive.)	
48	관리자들은 안전/보건 관련 평가나 보상을 언제 행해야 할지 잘 알지 못한다. Managers do not know when the assessments or rewards for the safety and health will be given. (Managers do not know when safety and health assessments or rewards will be given.)	Predictability
49	나는 안전/보건과 관련된 업무가 어떠한 방식으로 다루어지는지 예측할 수 있다. I can predict how safety and health-related work will be handled. (It is predicted how safety and health work will be done.)	Predictability
50	나의 상사는 안전/보건과 관련된 사항을 고려하여 구성원 별로 적합한 작업을 할당한다. My supervisor assigns appropriate work to each members, taking into account the safety and health issues. (My boss assign me with the appropriate safety and health work.)	Cooperation
51	나의 상사는 안전/보건 사안에 대해 결정할 때, 나의 관심과 의견을 존중한다. My supervisor respects my interests and opinions when making a decision about safety and health issues. (My boss respects my interests and opinions when making decisions about safety and health issues.)	Cooperation
52	우리 조직 구성원들은 안전/보건과 관련된 합의 내용을 잘 지킨다. Member of our organization keeps very well the consensus related to safety and health. (I think this organization will keep the consensus related to safety and health.)	Cooperation
53	경영진은 그들이 생각하는 안전/보건 정책이나 계획을 일방적으로 진행한다.(r) Management unilaterally conduct the safety and health policy or plan that they think.(r) (Management tries to push the safety and health policy or plan that they thinks.)	Cooperation
54	우리 조직은 안전/보건과 관련된 결정을 스스로 할 수 있도록 권한을 위임 해준다. Our organization give authorities their members to make safety and health decisions by themselves. (It authorizes me to make my own safety and health decisions.)	Trust(Reliance)
55	우리 조직은 안전/보건에 대한 신뢰를 증진시키기 위해 전사적인 조치를 취하고 있다. Our organization is implementing enterprise-wide measures to promote trust in safety and health. (The organization is implementing enterprise-wide measures to promote trust in safety and health.)	Trust(Reliance)
56	나는 안전/보건에 관한 관리자의 판단을 신뢰한다. I trust a decision of manager on safety and health. (I trust manager's judgment on safety and health.)	Trust(Reliance)

No	Draft items	Factor
57	경영진이 단독으로 안전/보건에 대한 결정을 하더라도 나는 그 결정을 믿고 수용할 수 있다. Even if management make safety and health decisions unilaterally, I can believe and accept them. (Even if management make their own safety and health decisions, I can believe and accept them.)	Trust(Reliance)
58	나는 나에게 불리하게 적용될 수 있는 안전/보건 관련 문제들도 기꺼이 논의할 수 있다. I am willing to discuss safety and health issues that may be disadvantaged to me. (I am willing to discuss safety and health issues that may be disadvantaged to me.)	Trust(Reliance)
59	나는 동료가 안전/보건 관련 업무를 잘 수행하지 못했다면, 예외적인 사정이 있었을 것이라고 생각한다. If other colleagues do not conduct well some work related to the safety and health, I think they have some exceptional reason. (If other colleagues did not do well in safety and health work, I think they have some reason.)	Trust(Reliance)
60	우리 조직 구성원들은 안전/보건 관련 교육이나 미팅에 자발적으로 참석한다. Member of our organization attend voluntarily a safety and health-related training and meetings. (Most employees will attend safety and health-related training and meetings.)	Trust(Reliance)
61	사고/부상과 관련해서 조직은 최선의 조치를 취한다. Our organization takes the best action related to the accident or injury. (I think it is the best for taking action by the organization related to the accident(or injury).)	Trust(Reliance)
62	안전/보건과 관련된 중요 문제를 관리자들이 직원들을 대신하여 잘 처리한다. Managers deal with important issues related to safety and health instead of their members. (Managers are committed to the safety and health work assigned to them.)	Trust(Reliance)
63	안전/보건 담당자들은 직원들의 안전/보건에 대한 노력과 행동을 지지해주고 있다. Safety and health Managers support the safety and health efforts and actions of employees. (Managers support the safety and health efforts and actions of employees.)	Trust(Reliance)
64	직원들은 안전/보건 관련 정책에 대한 관리자의 설명을 신뢰한다. Employees trust about the managers' explanation on the safety and health policies. (Employees rely on managers' explanation on safety and health policies.)	Trust(Reliance)
65	관리자들은 안전/보건과 관련된 문제나 어려움에 대해 직원들이 이야기 하는 것을 듣고 싶어 한다. Managers want to hear about safety health issues or difficulties from employees. (Managers want to hear about safety health issues or difficulties.)	Cooperation
66	나는 나에게 불이익이 될 수도 있지만, 안전/보건 업무와 관련한 어려움이나 문제가 발생하면 상사와 상의한다. Although it would be disadvantaged to me, I consult with my supervisor if I have any difficulties or problems related to safety and health work. (Although it would be disadvantaged to me, I consult with my boss if I have any difficulties or problems related to safety and health work.)	Cooperation
67	관리자들은 안전/보건 관련 사안에 대한 의견과 정보를 직원들과	Justice

No	Draft items	Factor
	공유한다. Managers share an information and opinion of the safety and health with their employees. (Managers frankly share information about safety and health compensation.)	
68	경영진은 안전/보건과 관련된 미래 계획에 대한 정보를 터놓고 공유한다. Management shares frankly future plan for the safety and health information. (Management opens and shares information on future plans related to safety and health.)	Justice
69	직원들은 동료나 관리자의 안전/보건 관련 의견에 반대하는 의견을 자유롭게 이야기 할 수 있다. Employees can freely talk about their opinion on the safety or health against the opinion of their colleagues or managers. (Employees can freely talk about their safety or health concerns or opinions against their colleagues or managers.)	Cooperation
70	우리 조직은 안전/보건 수준을 파악하는데 필요한 정보들을 공유한다. Our organization shares an information to identify the level of safety and health. (Much of the information needed to identify and assess safety and health levels is collected and shared.)	Cooperation
71	우리 조직은 나의 작업과 관련된 중요한 안전/보건 관련 정보를 전달하고 공유한다. Our organization transfers and shares an important safety and health information related to my work. (Important safety and health information related to my work is communicated and shared.)	Cooperation
72	우리 조직의 안전/보건 정책과 절차들은 윤리적인 측면을 충분히 반영하고 있다. The safety and health policies and process of our organization fully reflect the ethical aspects. (The safety and health policies and process of the organization fully reflect the ethical aspects.)	Justice
73	우리 조직은 직원들이 불쾌하게 생각할 수 있는 안전/보건 사안들도 사실대로 말한다. Our organization frankly speak the safety and health issues that its members may feel unpleasant. (Management is honest and does not hide anything about safety and health issues.)	Justice
74	우리 조직은 안전/보건과 관련된 모든 정보를 공개적으로 공유한다. Our organization shares all information related to the safety and health in public. (The organization shares all safety and health information in public.)	Cooperation
75	경영진의 안전/보건과 관련된 노력은 진심이다. Efforts of managements related to the safety and health are the true heart. (Efforts related to safety and health of Management are the true heart.)	Justice
76	관리자들의 안전/보건과 관련된 의사소통은 진심에서 우러난 것이다. Communication of managers related to the safety and health is the true heart. (Communication related to safety and health of managers is the true heart.)	Justice
77	관리자들은 안전/보건에 대한 성과를 높이기 위해 직원들에게 희생을 요구하지 않는다. Managers do not require employees to sacrifice to make a positive result of safety and health. (Managers do not ask employees to sacrifice to result positive safety and health.)	Justice

<Note> How to develop draft items

- Consist of draft items based on operational definition
- The contents of each items are needed to consider the contents of open-ended questionnaire and literature review.
- Key points in composition of preliminary question
 - Current Tense
 - Do not use sentences that can be interpreted as realistic things
 - Avoid sentences that can be interpreted as more than one
 - Avoid sentences like 'Yes' or 'No' response type
 - Consist of similar quantity of items with positive and negative content (After finishing composition of draft item)
 - Sentence length is as short as possible
 - Check for grammatical errors
 - Avoid all positive or all negative words like all, always, never, never, etc.
 - Avoid some adjectives like just almost, many
 - Easy-to-understand sentence
 - Avoid double negative statements
- It is needed to compose of 5 point Likert scale in order to check the response to the constructive concept of trust.
- In order to prevent the respondent's unfaithful response, more than 1/4 of the total items are needed to compose of inverse items (After finishing composition of draft item)
- Each factor is needed to assumes 4~5 items, and double quantity of items(8~10) is needed to compose of draft items. (In this case, we can expected about 50 items as a final version of indicator.)
- The final draft item is needed to review with external experts to make the content validity.

□ The first result of exploratory factorial analysis (as a kind of pre-test by only KOSHA)

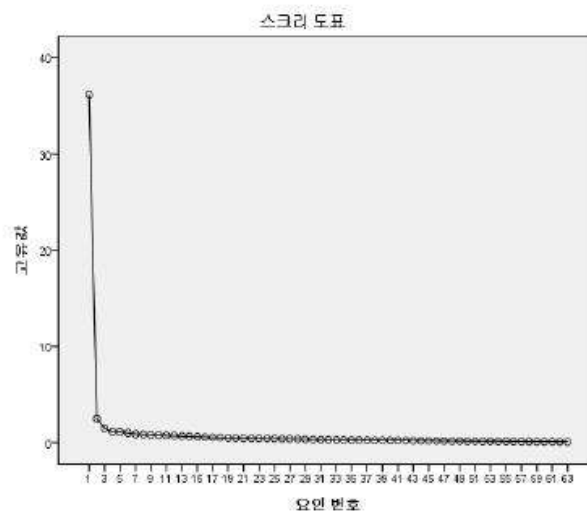
○ Participants(total 354 Korean Workers / Survey : October, 2018)

Factor	Variance	Frequency	Percentage	Valid percentage
Sex	Male	301	85.0	86.7
	Female	46	13.0	13.3
	Non-res.	7	2.0	
Ages	20s	24	6.8	6.9
	30s	85	24.0	24.5
	40s	113	31.9	32.6
	50s	93	26.3	26.8
	60s	26	7.3	7.6
	70s	6	1.7	1.7
	Non-res.	7	2.0	
Industries	Manufacture	192	54.2	56.0
	Electronic- Gas-Water	11	3.1	3.2
	Construction	43	12.1	12.5
	Transportation- Warehouse	15	4.2	4.4
	Service	72	20.3	21.0
	Other	10	2.8	2.9
	Non-res.	11	3.1	
Working type	Regular Work	308	87.0	88.5
	Non-regular work	26	7.3	7.5
	Short time work	5	1.4	1.4
	Daily work	8	2.3	2.3
	Other	1	.3	.3
	Non-res.	6	1.7	
Size of Company	Under 10	62	17.5	17.9
	11-100	180	45.2	46.1
	101-499	54	15.3	15.6
	500-999	7	2.0	2.0
	Over 1000	64	18.1	18.4
	Non-res.	7	2.0	
Total		354	100.0	

○ Value of factor loading

Factor	Initial Eigenvalues			Rotation Sums of Squared Loadings		
	Total	% of Variance	Cumulative %	Total	% of Variance	Cumulative %
1	36.122	57.336	57.336	8.526	13.533	13.533
2	2.489	3.952	61.288	8.295	13.167	26.700
3	1.512	2.399	63.687	8.136	12.915	39.615
4	1.163	1.846	65.533	7.929	12.585	52.200
5	1.117	1.773	67.306	7.806	12.390	64.590
6	1.028	1.632	68.938			
7	.913	1.450	70.388			
8	.878	1.394	71.782			
9	.825	1.309	73.091			
10	.777	1.233	74.325			
11	.758	1.203	75.528			
12	.722	1.145	76.673			
13	.684	1.086	77.758			

○ Scree Plots



○ Revised draft item according to the results of first analysis

- It was eliminated 14 items which have less factor loading value (under .40) or overlapped with other factors or have a qualitatively a different meaning with the constructed factors.

□ The Second Results of Exploratory factorial analysis

- Finally, 5 factors were constructed such as named "Openness, Competence, Cooperation, Care, Fairness".
- Total Rotation Sums of Squared Loading was **65.96%** in SPSS

No	Draft Items(Korean/English)	Pre-Factor	Factors by exploratory factorial analysis				
			Factor1 (Openness)	Factor2 (Competence)	Factor3 (Cooperation)	Factor4 (Care)	Factor5 (Fairness)
71	우리 조직은 나의 작업과 관련된 중요한 안전보건 관련 정보를 전달하고 공유한다. Our organization transfers and shares an important safety and health information related to my work.	Cooperation	.618				
73	우리 조직은 직원들이 불쾌하게 생각할 수 있는 안전보건 사항들도 사실대로 알린다. Our organization frankly speak the safety and health issues that its members may feel unpleasant.	Justice	.613				
67	관리자들은 안전보건 관련 사안에 대한 의견과 정보를 직원들과 공유한다. Managers share an information and opinion of the safety and health with their employees	Justice	.581			.400	
70	우리 조직은 안전보건 수준을 파악하는데 필요한 정보들을 공유한다. Our organization shares an information to identify the level of safety and health.	Cooperation	.586				
66	나는 나에게 불이익이 될 수도 있지만 안전보건 업무와 관련된 어려움이나 문제가 발생하면 상사와 상의할 수 있다. Although it would be disadvantaged to me, I consult with my supervisor if I have any difficulties or problems related to safety and health work.	Cooperation	.584				
69	직원들은 동료나 관리자의 안전보건 관련 의견에 반하는 의견을 자유롭게 이야기할 수 있다. Employees can freely talk about their opinion on the safety or health against the opinion of their colleagues or managers.	Cooperation	.577				
76	관리자들의 안전보건과 관련된 의사소통은 진심에서 우러나는 것이다. Communication of managers related to the safety and health is the true heart.	Justice	.577			.516	
63	안전보건 담당자들은 직원들의 안전보건에 대한 노력과 행동을 지지해주고 있다. Safety and health Managers support the safety and health efforts and actions of employees	Trust(Reliance)	.568			.405	
72	우리 조직의 안전보건 정책과 절차들은 윤리적인 측면을 충분히 반영하고 있다. The safety and health policies and process of our organization fully reflect the ethical aspects.	Justice	.562				

No	Draft Items(Korean/English)	Pre-Factor	Factors by exploratory factorial analysis				
			Factor1 (Openness)	Factor2 (Competence)	Factor3 (Cooperation)	Factor4 (Care)	Factor5 (Fairness)
74	우리 조직은 안전보건과 관련된 모든 정보를 공개적으로 공유한다. Our organization shares all information related to the safety and health in public.	Cooperation	.533			.437	
64	직원들은 안전보건 관련 정책에 대한 관리자의 설명을 신뢰한다. Employees trust about the managers' explanation on the safety and health policies.	Trust(Reliance)	.530				
68	경영진은 안전보건과 관련된 미래 계획에 대한 정보를 타놓고 공유한다. Management shares frankly future plan for the safety and health information.	Justice	.527			.397	.396
65	관리자들은 안전보건과 관련된 문제나 어려움에 대해 직원들이 이야기 하는 것을 듣고 싶어 한다. Managers want to hear about safety health issues or difficulties from employees.	Cooperation	.503				
56	나는 안전보건에 관한 관리자의 판단을 신뢰한다. I trust a decision of manager on safety and health.	Trust(Reliance)	.460				
62	안전보건과 관련된 중요 문제를 관리자들이 직원들을 대신하여 잘 처리한다. Managers deal with important issues related to safety and health instead of their members.	Trust(Reliance)	.453				
77	관리자들은 안전보건에 대한 성과를 만들기 위해 직원들에게 희생을 요구하지 않는다. Managers do not require employees to sacrifice to make a positive result of safety and health.	Justice	.438				
51	나의 상사는 안전보건 사안에 대해 결정할 때 나의 관심과 의견을 존중한다. My supervisor respects my interests and opinions when making a decision about safety and health issues.	Cooperation	.431				
58	나는 나에게 불리하게 작용할 수 있는 안전보건 관련 문제들도 가려논의할 수 있다. I am willing to discuss safety and health issues that may be disadvantaged to me.	Trust(Reliance)	.426				
21	우리 조직은 직원들이 합의한 안전보건 관련 사안들을 실현할 수 있는 효과적인 체도가 있다. Our organization has an effective system to realize the safety and health issues agreed by our employees.	Trust(Confidence)		.667			
22	우리 조직은 직원들에게 안전보건과 관련된 정보를 제공하는 피드백 체도를 갖추고 있다. Our organization has a feedback system that provides safety and health information to employees.	Trust(Confidence)		.666			

No	Draft Items(Korean/English)	Pre-Factor	Factors by exploratory factorial analysis				
			Factor1 (Openness)	Factor2 (Competence)	Factor3 (Cooperation)	Factor4 (Care)	Factor5 (Fairness)
17	우리 조직의 구성원들은 안전보건과 관련된 목표를 달성하는데 기여를 하고 있다. Members of our organization contribute to the achievement of the organization's safety and health goals.	Trust(Competence)		.595	.429		
19	우리 조직 구성원들은 안전보건에 대한 명확한 목표의식이 있다. Members of our organization have a clear sense of purpose for safety and health.	Trust(Confidence)		.588			
20	우리 조직의 경영진은 안전보건과 관련된 명확한 방향성을 제시한다. Management of our organization presents a clear direction for safety and health.	Trust(Confidence)		.568		.476	
15	우리 조직은 신입사원이 안전하고 건강하게 근무할 수 있도록 체계적인 훈련과 교육을 제공하고 있다. Our organization provides systematic training and education for new employees to help safety and health work.	Trust(Competence)		.566			
18	우리 조직의 구성원들이 안전하게 작업을 수행하는 것에 매우 익숙하다. Members of our organization are very good at doing safety work.	Trust(Competence)		.541			
33	우리 조직은 안전보건 문제를 상호 협력하여 해결할 수 있는 문화가 구축되어 있다. Our organization has built a culture to solve the safety and health issues through a cooperation with each other.	Cooperation		.527			.410
11	우리 조직의 구성원들은 업무 경험을 통해 사고를 예방할 수 있는 방법을 지속적으로 학습한다. Members of our organization continually learn the way to prevent accidents through their work experience.	Trust(Competence)		.524	.465		
55	우리 조직은 안전보건에 대한 신뢰를 증진하기 위해 전사적인 조치를 취하고 있다. Our organization is implementing enterprise-wide measures to promote trust in safety and health.	Trust(Reliance)		.475			
8	우리 조직의 관리자들은 안전보건 관리에 있어 충분한 능력과 기술을 가지고 있다. Managers of our organization have sufficient abilities and skills in safety and health management.	Trust(Competence)		.473	.422		
14	우리 조직의 신입사원 선발 과정에는 안전보건 관련 지식과 태도를 평가하는 절차가 있다. Our organization have a process to evaluate safety and health knowledge and attitudes of a new employee in the selection process.	Trust(Competence)		.442			.392
26	우리 조직의 구성원들은 안전보건 관련 사항이 정해지면 이를 준수하고 따른다. Members of our organization comply with and follow the safety and health rule when it sets as a new.	Predictability		.410	.396		

No	Draft Items (Korean/English)	Pre-Factor	Factors by exploratory factorial analysis				
			Factor1 (Openness)	Factor2 (Competence)	Factor3 (Cooperation)	Factor4 (Care)	Factor5 (Fairness)
41	우리 조직은 구성원의 지위고하를 막론하고 일관된 안전보건 규정을 적용한다. Our organization applies the consistent safety and health regulations regardless of the status of its members.	Justice		.395			
3	우리 조직 구성원들은 안전보건과 관련된 어떠한 문제를 공유할 때 서로 지지하는 모습을 보여줄 것이다. Our members of organization will show a supportive responses when some safety and health related issues can be shared with them.	Care			.643		
4	우리 조직 구성원들은 안전보건과 관련된 제안이나 문제를 경청한다. Members of organization listen carefully to suggestions or issues related to safety and health.	Care			.637		
7	우리 조직 구성원들은 안전보건 사항과 관련하여 서로를 진심으로 배려한다. Members of our organization seriously take care of each other related to safety and health issues.	Care			.611		
9	나는 우리 조직의 안전보건 관리 기술에 대한 긍정적 믿음을 가지고 있다. I have a positive belief in the organization's safety and health management skills.	Trust(Competence)		.410	.539		
34	동료들과 함께 일하기 때문에 안전보건 목표를 더 효과적으로 성취할 수 있다. By working with colleagues, I can achieve our safety and health goals more effectively.	Cooperation			.524		.422
13	우리 조직의 구성원들은 안전보건 관련 교육과 훈련이 긍정적인 효과가 있다고 생각한다. Members of our organization think that safety and health education and training have a positive effects.	Trust(Competence)			.516		
12	우리 조직의 안전보건 관리자가 행하는 현장 점검이나 평가는 안전보건 개선과 사고 예방에 긍정적인 영향을 미친다. On-site inspection and evaluation done by the safety and health manager has positive effects on safety and health improvement and prevention of accidents.	Trust(Competence)		.432	.505		
10	우리 조직의 구성원들은 안전하게 일할 수 있는 능력이 있다. Members of our organization have the ability to keep the safe work.	Trust(Competence)		.404	.495		
32	나의 안전보건이 우리 조직의 안전보건과 연결되어 있다고 느낀다. I feel my safety and health issue is connected to the safety and health issue of the organization.	Cooperation			.483		

No	Draft Items(Korean/English)	Pre-Factor	Factors by exploratory factorial analysis				
			Factor1 (Openness)	Factor2 (Competence)	Factor3 (Cooperation)	Factor4 (Care)	Factor5 (Fairness)
1	우리 조직은 안전보건과 관련된 중요한 의사결정을 할 때 구성원들의 의견 요구를 고려한다. Our organization considers the opinions and needs of its members when making important safety and health decisions.	Care			.478	.403	
28	우리 조직의 직원들은 누군가 안전 문제를 지적한다면 이에 대한 해결책을 찾으려고 함께 노력한다. Members of our organization try to find out a solution if someone points out a safety issue.	Cooperation			.472		
30	우리 조직 구성원들은 동료가 안전보건과 관련된 도움이 필요할 때 가이도를 준다. Members of our organization will help their colleague when their colleague need some help related to the safety and health.	Cooperation			.469		
5	우리 조직의 경영진들은 직원들의 관점에서 안전보건과 관련된 일을 관철하려고 한다. Management of our organization seeks to do safety and health work from the perspective of employees.	Care				.666	
6	우리 조직의 경영진들은 안전보건과 관련된 사안에 대해 직원들을 도와줄 수 있는 방법을 찾기 위해 노력한다. Management of our organization tries to find out the way to help employees issues for safety and health.	Care				.640	
75	경영진의 안전보건과 관련된 노력은 진심이다. Efforts of managements related to the safety and health are the true heart.	Justice	.456			.597	
31	우리 경영진들은 조직의 재정적 이득보다 직원들의 안전보건과 관련된 사항을 우선시한다고 생각한다. The best priority of our Managements is the safety and health issue than the profit of organization.	Cooperation				.576	.458
29	우리 경영진들은 더 나은 안전보건 환경을 만들기 위해 투자를 아끼지 않는다. Our Managements do not hesitate the investment to build a better safety and health environment.	Cooperation		.419		.503	.394
36	나와 내 동료들은 안전을 지키는데 있어 관리자들이 도움을 줄 것으로 기대한다. I and my colleagues expect that managers give a help to keep our safety.	Predictability				.491	
45	경영진의 안전보건에 대한 정책의 의도와 동기가 산하다고 생각한다. I think that safety and health policy intention and motivation of management are good.	Care	.413			.485	

No	Draft Items(Korean/English)	Pre-Factor	Factors by exploratory factorial analysis				
			Factor1 (Openness)	Factor2 (Competence)	Factor3 (Cooperation)	Factor4 (Care)	Factor5 (Fairness)
44	경영진의 결정과 행동은 안전보건에 대한 올바른 원칙에 기반하고 있다. Decisions and actions of management are based on the right principles of safety and health.	Trust(Reliance)				.483	.438
61	사고부상과 관련해서 조직은 최선의 조치를 취한다. Our organization takes the best action related to the accident or injury.	Trust(Reliance)	.420			.460	
25	우리 조직의 경영진들은 안전보건관련 사안들에 대한 약속을 지킨다. Management keep the appointment related to safety and health issues.	Predictability				.450	
46	나는 안전보건에 관한 관리자의 피드백을 긍정적으로 받아들인다. I positively accept a feedback of manager related to safety and health.	Care				.433	
38	나와 내 동료들은 안전보건에 대한 노력을 한다면 인정을 받을 수 있을 것으로 기대한다. I and my colleagues expect to be credited if they make effort for the safety and health.	Predictability					.759
37	나와 내 동료들은 안전보건에 대한 노력을 한다면 보상을 받을 수 있을 것으로 기대한다. I and my colleagues expect to be rewarded if they make effort for the safety and health.	Predictability					.715
39	우리 조직 구성원들은 우리 조직의 안전보건에 대한 일관된 믿음을 가지고 있다. Member of our organization have an undoubted belief for the safety and health.	Predictability			.406		.594
35	우리 조직은 안전보건과 관련된 상호 기대에 부응하고 있다고 생각한다. I think that our organizations respond to mutual expectation related to the safety and health.	Predictability			.480		.512
40	우리 조직은 직원들이 안전보건을 관리하는데 있어 공정하기 위해 노력하고 있다. The organization tries to commit to fairness in managing the safety and health of employees.	Justice			.414		.508
43	나는 관리자들의 안전 관리 방식이 합당하다고 믿는다. I believe that the way of safety management of managers is reasonable.	Justice				.465	.466
27	우리 조직의 구성원들은 어떤 상황에서도 안전보건과 관련된 사안을 우선시 한다. Members of our organization prioritize the safety and health issue under any circumstance.	Predictability			.451		.454
50	나의 상사는 안전보건과 관련된 사항을 고려하여 구성원 별로 적합한 작업을 할당한다. My supervisor assigns appropriate work to each members, taking into account the safety and health issues.	Cooperation					.399

□ Comparison between 'Pre' and 'After' by KOSHA

Pre-expected factors	Frequency of Items	After factorial analysis	Frequency of Items	Cronbach's α
Care	10	Openness	18	0.963
Cooperation	17	Competence	14	0.957
Justice	11	Cooperation	12	0.938
Predictability	11	Care	11	0.946
Trust(Competence)	11	Fairness	8	0.928
Trust(Confidence)	5			
Trust(Reliance)	12			
Total	77	Total	63	

※ The expected factor from DGUV (in the last Email on 26th Sep)

- Reliance, Cooperation, Predictability, Competence, Care, Fairness

6. Criterion validity with safety and health issue

Factors	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
1) Trust_Openness	-														
2) Trust_Competence	.818**	-													
3) Trust_Cooperation	.813**	.874**	-												
4) Trust_Care	.886**	.847**	.822**	-											
5) Trust_Fairness	.832**	.853**	.833**	.867**	-										
6) Safety Value	.569**	.585**	.577**	.655**	.573**	-									
7) Safety Communication	.677**	.722**	.703**	.706**	.641**	.635**	-								
8) Education and training	.661**	.729**	.726**	.707**	.641**	.582**	.760**	-							
9) Safety system	.694**	.806**	.750**	.733**	.716**	.557**	.733**	.781**	-						
10) Safety leadership	.555**	.570**	.596**	.612**	.553**	.581**	.643**	.552**	.566**	-					
11) C. B	.640**	.633**	.635**	.619**	.623**	.477**	.516**	.525**	.568**	.482**	-				
12) P. B	.608**	.652**	.645**	.631**	.613**	.462**	.551**	.567**	.600**	.492**	.809**	-			
13) R. P	-.139**	-.071	-.064	-.134*	-.057	.002	-.067	-.098	-.128*	-.146**	-.155**	-.131*	-		
14) D. A. E.	-.157**	-.057	-.055	-.126*	-.076	-.067	-.112*	-.109*	-.081	-.146**	-.119*	-.116*	.266**	-	
15) I. A. E.	-.113*	-.046	-.066	-.124*	-.085	-.099	-.122*	-.126*	-.071	-.120*	-.026	-.019	.148**	.489**	-
M	3.832	3.706	3.995	3.868	3.730	4.231	3.967	3.917	3.737	3.727	4.181	4.185	2.515	0.858	2.337
SD	0.700	0.775	0.641	0.748	0.752	0.812	0.796	0.774	0.899	0.797	0.764	0.699	1.047	1.902	6.228
N	350	351	353	352	350	352	352	353	353	352	340	349	340	353	353

11) C. B. = Compliance Behavior, 12) P. B = Participation Behavior, 13) R. P. = Risk Perception, 14) D.A.D = Direct Accident Experience, 15) I.A.E = Indirect Accident Experience

7. Discussion needed

□ Common sense for the boundary of developing leading indicator

- We need to focus and narrow the boundary

□ Language issue (English, Korean, German)

- This is main issue for the leading indicator because this is national level of research
- example.

Step	Process	Language
Literature review	DGUV and KOSHA have reviewed literature using each database	English / Germany / Korean
	↓	↓
Draft Item	The first draft items using the major languages of each country	Germany / Korean
	↓	↓
Final Draft Item	The final draft items from both institutions	English
	↓	↓
Workplace Survey	What kind of language?	?

□ Making the final draft items

- It is very practical issue to develop the draft items
- (ex) how many numbers of items (50? or 70?)
- (ex) how to construct the items such as containing safety and health system, employees behavior, or psychological approach?
- (ex) who is the participants of this draft items like organization, managements, manager (or supervisor), or just employee

□ The expert workshop

- When, Where, Who

□ Detail survey method issue

- How many workplace do we need to survey?
- Common workplace between Germany and Korea or separately?
- Survey timing and specific method (distribute the questionnaires by researcher or deliver the questionnaire to workplace)
- even what kind of gift to participant?

□ **How to analyze the data from workplace**

- using same statistical analysis

□ **How to write the annual report as a second year joint research**

- Way to make a common working document file
- It would be needed to organize all reviewed literature, process, and even discussed contents at research meeting to reduce the annual report work.

<Appendix 1> Example items in literature review

No	Reference	Factor	Items in reference
1	Bitar F. K., Jones D. C., Lawrie M., Nazaruk M., Boodhai C. (2018).	trust in management	I trust and respect the management of the company
		trust in the company	The company is taking the right action to rebuild trust and relationships globally
		pride in working for the company	I feel proud to work for the company
		leaders listening to all perspectives	Leaders in my part of the business listen carefully to all perspectives
2	Givchchi S., Hemmativaghef E., Hoveidi H. (2017).	Safety communication, learning and trust in co-workers safety competence(Cronbach's a .7)	We who work here try to find a solution if someone points out a safety problem
			We who work here feel safe when working together
			We who work here have great trust in each other's ability to ensure safety
			We who work here learn from our experiences to prevent accidents
			We who work here take each other's opinions and suggestions concerning safety seriously
			We who work here seldom talk about safety
			We who work here always discuss safety issues when such issues come up
			We who work here can talk freely and openly about safety
		Workers' trust in efficacy of safety systems(Cronbach's a .79)	We who work here consider that a good safety representative plays an important role in preventing accidents
			We who work here consider that safety rounds/evaluations have no effect on safety
			We who work here consider that safety training to be good for preventing accidents
			We who work here consider early planning for safety as meaningless
			We who work here consider that safety rounds/evaluations help find serious hazards
			We who work here consider safety training to be meaningless
			We who work here consider it important to have clear-cut goals for safety
3	Walker A. (2013).	other	I am not sure I fully trust my employer (R).
			My employer is open and upfront with me.
			I believe my employer has high integrity.
			In general, I believe my employer's motives and intentions are good.
			My employer is not always honest and truthful (R).
			I don't think my employer treats me fairly (R).
			I can expect my employer to treat me in a consistent and predictable fashion.
4	Conchie S. M., Taylor P. J.,	Affect based trust belief	We have a sharing relationship. We can both freely share our ideas, feelings, and hopes.

No	Reference	Factor	Items in reference
	Donald I. J. (2012).		I can talk freely to this individual about difficulties I am having at work and know that (s)he will want to listen.
			We would both feel a sense of loss if one of us was transferred and we could no longer work together.
			If I shared my problems with this person, I know (s)he would respond constructively and caringly.
			I would have to say that we have both made considerable emotional investments in our working relationship.
		Cognition based trust belief	I trust my supervisor to be fair in the way he deals with safety
			I trust my supervisor's judgment when it comes to safety
			I trust my supervisor's ability to make sure jobs are carried out safely.
		Reliance intentions	I would be willing to let CEO have complete control over the future of this company
			I would be comfortable having CEO work on a task or problem that was critical to Wire Services, even if the company could not monitor his actions
			I would be comfortable having CEO make decisions that critically affect me (e.g., employee compensation, layoffs)
			I would be willing to let CEO make almost all key decisions at Wire Services without oversight by others.
			If I had my way, I would not let CEO have any influence over issues that are important to Wire Services. (Reverse-scored)
		Disclosure intentions	I would be willing to discuss safety-related problems that could potentially be used against me.
5	Kines P., Lappalainen J., Kim L. M., Olsen E., Pousette A., Tharaldsen J., Tomasson K., Torner M. (2011).	Safety communication, learning, and trust in co-worker safety competence (8 items)	We who work here try to find a solution if someone points out a safety problem
			We who work here feel safe when working together
			We who work here have great trust in each others' ability to ensure safety
			We who work here learn from our experiences to prevent accidents
			We who work here take each others' opinions and suggestions concerning safety seriously
			We who work here seldom talk about safety
			We who work here always discuss safety issues when such issues come up
			We who work here can talk freely and openly about safety
		Workers' trust in the efficacy of safety systems (7 items)	We who work here consider that a good safety representative plays an important role in preventing accidents
			We who work here consider that safety rounds/evaluations have no effect on safety
			We who work here consider that safety training is good for preventing accidents

No	Reference	Factor	Items in reference
			We who work here consider early planning for safety as meaningless
			We who work here consider that safety rounds/evaluations help find serious hazards
			We who work here consider that safety training is meaningless
			We who work here consider that it is important that there are clear-cut goals for safety
6	Burt C. D. B., Chmiel N., Hayes P. (2009). Implications of turnover and trust for safety attitudes and behaviour in work teams. Safety Science, 47, 1002-1006.	Trust in selection	Safety attitudes are considered equally as important as job skills when selecting a new member for my crew.
			Safety attitudes are assessed when a new member is selected for my crew.
			The organisation knows all the safety issues to assess in applicants who apply to join my crew.
			The organisation recruits new crew members who have good safety attitudes.
		Trust in Induction	The organisation's safety training ensures a new crew member behaves safely.
			Crew supervisors provide safety information for a new crew member.
7	Johnson-George C., Swap W. C. (1982).	Overall Trust(Male)	Management ensure that a new crew member fully understands all safety procedures and policy.
			If ____ gave me a compliment I would, question if ____ really meant what was said.
			If we decided to meet somewhere for lunch, I would be certain ____ would be there.
			I would go hiking with ____ in unfamiliar territory if ____ assured me he/she knew the area.
			I wouldn't want to buy a piece of used furniture from ____ because I wouldn't believe his/her estimate of its worth.
			I would expect ____ to play fair.
			I could rely on ____ to mail an important letter for me if I couldn't get to the post office.
			I would be able to confide in ____ and know that he/she would want to listen.
			I could expect ____ to tell me the truth.
			If I had to catch an airplane, I could not be sure ____ would get me to the airport on time.
		Emotional Trust(Male)	If ____ unexpectedly laughed at something I did or said, I would wonder if he/she was being critical and unkind
			I could talk freely to ____ and know that ____ would want to listen.
			____ would never intentionally misrepresent my point of view to others.
			If ____ knew what kinds of things hurt my feelings, I would never worry that he/she would use them against me, even if our relationship changed.
			I would be able to confide in ____ and know that he/she would want to listen

No	Reference	Factor	Items in reference
			If ____ didn't think I had handled a certain situation very well, he/she would not criticize me in front of other people.
			If I told ____ what things I worry about, he/she would not think my concerns were silly.
		Reliability(Male)	If my alarm clock was broken and I asked ____ to call me at a certain time, I could count on receiving the call.
			If ____ couldn't get together with me as we planned, I would believe his/her excuse that something important had come up.
			If ____ promised to do me a favor, he/she would follow through.
			If ____ were going to give me a ride somewhere and didn't arrive on time, I would guess there was a good reason for the delay.
			If we decided to meet somewhere for lunch, I would be certain he/she would be there.
		Reliability(Female)	If I were injured or hurt, I could depend on ____ to do what was best for me.
			If ____ borrowed something of value and returned it broken, ____ would offer to pay for the repairs
			If my alarm clock was broken and I asked ____ to call me at a certain time, I could count on receiving the call.
			If ____ agreed to feed my pet while I was away, I wouldn't worry about the kind of care it would receive.
			If ____ promised to do me a favor, he/she would follow through.
			If ____ were going to give me a ride somewhere and didn't arrive on time, I would guess there was a good reason for the delay.
			I would be willing to lend ____ almost any amount of money, because he/she would pay me back as soon as he/she could.
		Emotional Trust(Female)	If ____ couldn't get together with me as we had planned, I would believe his/her excuse that something important had come up.
			I could talk freely to ____ and know that he/she would want to listen.
			____ would never intentionally misrepresent my point of view to others
			If ____ knew what kinds of things hurt my feelings, I would never worry that he/she would use them against me, even if our relationship changed.
			I would be able to confide in ____ and know that he/she would not discuss my concerns with others.
			I could expect ____ to tell me the truth.
8	Gurtman M. B. (1992).	interpersonal trust	Most people can be counted on to do what they say they will do In these competitive times one has to be alert or someone is likely to take advantage of you Most salesmen are honest in describing their products.
9	Conchie S. M.,	Safety-specific trust	I trust my supervisor to be fair in the way he deals with safety

No	Reference	Factor	Items in reference
	Donald I. J. (2009).		I trust my supervisor's judgment when it comes to safety
			I trust my supervisor's ability to make sure jobs are carried out safely
10	Conchie S. M. (2013).	Safety-specific trust	I trust my supervisor to be fair in the way he deals with safety
			I trust my supervisor's judgment when it comes to safety
			I trust my supervisor's ability to make sure jobs are carried out safely
11	Schaubroeck J., Peng A. C., Lam S. S. K. (2011).	Affect-based trust	We have a sharing relationship. We can both freely share our ideas, feelings, and hopes.
			I can talk freely to this individual about difficulties I am having at work and know that (s)he will want to listen.
			We would both feel a sense of loss if one of us was transferred and we could no longer work together.
			If I shared my problems with this person, I know (s)he would respond constructively and caringly.
			I would have to say that we have both made considerable emotional investments in our working relationship.
		Cognition-based trust	This person approaches his/her job with professionalism and dedication.
			Given this person's track record, I see no reason to doubt his/her competence and preparation for the job.
			I can rely on this person not to make my job more difficult by careless work.
			Most people, even those who aren't close friends of this individual, trust and respect him/her as a coworker.
			Other work associates of mine who must interact with this individual consider him/her to be trustworthy.
			If people knew more about this individual and his/her background, they would be more concerned and monitor his/her performance more closely.
12	Colquitt J. A., LePine J. A., Piccolo R. F., Zapata C. P., Rich B. L. (2012).	Affect-based trust	My supervisor and I freely share our ideas and feelings.
			I can talk freely to my supervisor about difficulties I am having at work.
			We would both feel a sense of loss if one of us was transferred.
			My supervisor responds caringly when I share my problems.
			My supervisor and I have invested a lot in our working relationship.
		Cognition-based trust	My supervisor approaches his/her job with dedication.
			I see no reason to doubt my supervisor's competence for the job.
			I can rely on my supervisor not to make my job more difficult.
			Most people trust and respect my supervisor as a coworker.
			My peers consider my supervisor to be trustworthy.

No	Reference	Factor	Items in reference
			If people knew more about my supervisor, they would be more concerned and monitor his/her performance more closely.
13	Mayer, R. C., & Davis, J. H. (1999).	Ability	If I had my way, I wouldn't let top management have any influence over issues that are important to me.
		Benevolence	I would be willing to let top management have complete control over my future in this company.
		Integrity	I really wish I had a good way to keep an eye on top management.
		Propensity	I would be comfortable giving top management a task or problem which was critical to me, even if I could not monitor their actions.
14	Tong, D. Y. K., Rasiah, D., Tong, X. F., & Lai, K. P. (2015).	other	We are confident that the production team knows their role and responsibility in occupational health and safety.
		Trust in employer	I believe my employer has high integrity.
			My employer is not always honest and truthful.*
			In general, I believe my employer's motives and intentions are good.
			I don't think my employer treats me fairly.*
			My employer is open and up-front with me
		Interpersonal trust at work	I can trust the people I work with to lend me a hand if I need it.
			Most of my workmates can be relied upon to do as they say will do.
			I can rely on other workers not to make my job more difficult by careless work.*
			Our management would be quite prepared to gain advantage by deceiving the workers.*
			Management can be trusted to make sensible decisions for the firm's future.
		Trust measures	I feel free to discuss work problems with my immediate supervisor without fear of having it used against me later.
			I can rely on members of my workgroup to help me if I have difficulty getting the job done
			When management must make decisions which seem to be against the best interests of the employee, I believe management's decisions are justified by other considerations.
15	Pilbeam, C., Doherty, N., Davidson, R., & Denyer, D. (2016).	Affective trust	We have a sharing relationship. We can both freely share our ideas, feelings, and hopes.
			I can talk freely to this individual about difficulties I am having at work and know that (s)he will want to listen
			We would both feel a sense of loss if one of us was transferred and we could no longer work together.
			If I shared my problems with this person, I know (s)he would respond constructively and caringly.
			I would have to say that we have both made considerable emotional investments in our working relationship.

<Appendix 2> First suggested tough draft items by KOSHA on last Sep.

○ Red one : Selected as a revised items for final draft items

Factor	Re-Factor	#	1차 예비문항(한국어/English)
Cooperation	Cooperation	1	조 직에서 일하는 노동자들은 누군가가 안전 문제를 지적하면 해결책을 찾으려고 노력한다. Employees working in organization try to find a solution if someone points out a safety issue.
		2	조 직에서 일하는 노동자들은 안전보건과 관련된 생각, 느낌, 기대를 자유롭게 이야기할 수 있다. Employees working in organization can freely talk about ideas, feelings, and expectations related to safety and health.
		3	경영진은 보다 나은 안전보건 환경 구축을 위해 많은 것을 투자했다. Managements have invested a lot in building a better safety and health environment.
		4	나와 함께 일하는 사람들은 안전보건과 관련하여 필요할 때 도와 줄 것이다. Those who work with me will help me when I need it in safety and health.
		5	조 직의 이익보다 직원들의 안전보건을 최우선 시한다고 생각한다. I think that the safety and health of the employees is the highest priority than the profit of the organization.
		6	조 직의 성공을 위해 직원들이 헌신하고 있다고 생각한다. I think the employees are dedicated to the success of the organization.
		7	조 직에서는 안전보건과 관련된 다양한 의견을 제안할 수 있도록 격려한다. The organization encourages the proposal of various opinions related to safety and health.
		8	나의 안전보건이 조 직의 안전보건과 연결되어 있다고 느낀다. I feel my safety and health issue is connected to the safety and health issue of the organization.
		9	나의 안전보건에 대한 가치는 나의 동료들의 가치와 비슷하다. The value of my safety and health is similar to the value of my colleagues.
		10	조 직은 안전보건 문제를 상호 협력하여 해결할 수 있는 문화가 구축되어 있다. The organization has a culture in which the safety and health issues can be solved in cooperation.
		11	현재 동료들과 함께 일하기 때문에 안전보건 목표를 더 효과적으로 성취할 수 있다. Working with colleagues at this moment can help me achieve our safety and health goals more effectively.
		12	이 조 직에서 일하는 직원들은 안전보건에 대한 서로 의견과 제안을 진지하게 받아들인다. Employees working in this organization take their opinions and suggestions seriously about safety and health.
		13	함께 일하는 사람들과 안전과 건강에 관해 많은 이야기를 한다. I talk a lot about safety and health with people working together.
Reciprocity		1	나의 상사는 나에게 적합한 안전보건 작업을 맡긴다. My boss assign me with the appropriate safety and health work.

Sharing		2	나의 상사는 안전/보건 사안에 대한 결정을 할 때, 나의 관심과 의견을 존중한다. My boss respects my interests and opinions when making decisions about safety and health issues.
		3	이 조직은 안전보건과 관련된 합의를 지킬 것이라고 생각한다. I think this organization will keep the consensus related to safety and health.
		4	경영진은 생각하는 안전보건 정책이나 계획을 밀어붙이려고 한다. Management tries to push the safety and health policy or plan that they think.
		1	이 조직에서 일하는 직원들은 자유롭게 공개적으로 안전문제에 관해 말 할 수 있다. Employees working in this organization can speak freely and openly about safety issues.
		2	관리자들은 안전보건과 관련된 문제나 어려움에 대해 이야기 하는 것을 듣고 싶어 한다. Managers want to hear about safety health issues or difficulties.
		3	나에게 불이익이 될 수도 있지만, 안전/보건 업무와 관련한 어려움이나 문제가 발생하면 상사와 상의한다. Although it would be disadvantaged to me, I consult with my boss if I have any difficulties or problems related to safety and health work.
		4	관리자들은 안전보건 관련 사안에 대한 의견과 정보를 직원들과 공유한다. Managers share opinions and information about safety and health issues with employees.
		5	경영진은 안전보건과 관련된 미래 계획에 대한 정보를 되돌고 공유한다. Management opens and shares information on future plans related to safety and health.
		6	직원들은 동료나 관리자의 안전보건 관련 의견이나 생각에 반대하는 의견을 자유롭게 이야기 할 수 있다. Employees can freely talk about their safety or health concerns or opinions against their colleagues or managers.
		7	안전보건 수준을 파악하고 평가하는데 필요한 많은 정보들이 수집되고 공유된다. Much of the information needed to identify and assess safety and health levels is collected and shared.
Reliance	trust	8	나의 작업과 관련된 중요한 안전보건 관련 정보가 전달되고 공유된다. Important safety and health information related to my work is communicated and shared.
		1	조직의 안전보건 정책 운영에 올바른 원칙이 적용된다. The right principles apply to the organization's safety and health policy operations.
		2	조직이 안전보건에 대한 약속을 지킬 것이라고 믿는다. I believe the organization will keep its appointment to safety and health.
		3	나에게 안전보건과 관련된 결정을 스스로 할 수 있도록 권한을 위임해 준다. It authorizes me to make my own safety and health decisions.
		4	나는 회사의 경영진을 신뢰하고 존경한다. I trust and respect the management of the company.
		5	조직은 안전보건에 대한 신뢰를 증진시키기 위해 전사적인 조치를 실행하고 있다. The organization is implementing enterprise-wide measures to promote trust in safety

		and health.
6	이 조직에서 일하는 직원들은 함께 일하면서 안전하다고 느낀다. Employees working in this organization feel safe working together.	
7	나는 안전보건에 관한 관리자의 판단을 신뢰한다. I trust manager's judgment on safety and health.	
8	나는 경영진이 조직의 안전보건 정책을 잘 이끌어 나갈 것이라고 믿는다. I believe management will lead safety and health policies of the organization well.	
9	경영진이 단독으로 안전보건에 대한 결정을 하더라도 나는 그 결정을 믿고 수용할 수 있다. Even if management make their own safety and health decisions, I can believe and accept them.	
10	나에게 불리하게 적용될 수 있는 안전보건 관련 문제들도 가까이 논의할 수 있다. I am willing to discuss safety and health issues that may be disadvantaged to me.	
11	내가 안전보건 관련 업무를 잘 수행하지 못하더라도 관리자들은 이를 나에게 이야기 하지 않을 것이다. Even if I do not do well in safety and health work, managers will not tell others.	
12	내가 안전보건 관련 업무를 잘 수행하지 못하더라도 관리자들은 질책하거나 처벌하지 않을 것이다. Even if I do not do well in safety and health work, managers will not reprimand or punish me.	
13	다른 동료가 안전보건 관련 업무를 잘 수행하지 못했다면, 그 이유가 있었을 것이라고 생각한다. If other colleagues did not do well in safety and health work, I think they have some reason.	
14	안전보건 관련 교육이나 미팅에 대부분의 직원들이 참석할 것이라고 생각한다. Most employees will attend safety and health-related training and meetings.	
15	조직이 취하고 있는 사고(또는 부상) 관련 조치들이 최선이라고 생각한다. I think it is the best for taking action by the organization related to the accident (or injury).	
16	관리자들은 그들에게 주어진 안전보건 업무에 대해 헌신한다. Managers are committed to the safety and health work assigned to them.	
17	각 부서의 직원들은 작업장 안전과 건강을 위한 그들의 역할과 책임을 알고 있다고 생각한다. The employees at each department think they know their roles and responsibilities for safety and health in workplace.	
18	경영진은 우리 조직의 안전보건 증진을 위해 합리적인 결정을 내릴 것이다. Management will make reasonable decisions to improve the safety and health of our organization.	
19	경영진의 안전보건 의사 결정이 직원들의 의견과 다를 때, 나는 경영진이 다른 사항들을 고려하여 적절한 결정을 한 것이라고 믿는다. When safety and health decisions of management differ from those of employees, I believe that management has made the right decisions, taking other factors into account.	

		20	관리자들이 안전보건 관련된 중요한 문제를 직원들을 대신하여 잘 처리한다고 생각한다. I believe that managers can handle important safety and health issues well on behalf of employees.
		21	내가 안전보건과 관련하여 어려움을 겪으면 동료와 상사들이 도와 줄 것이다. Colleagues and boss will help if I have difficulties with safety and health.
		22	관리자들은 직원들의 안전보건에 대한 노력과 행동을 지지해주고 있다. Managers support the safety and health efforts and actions of employees.
		23	경영진의 결정과 행동은 안전보건에 대한 올바른 원칙에 기반하고 있다. Management decisions and actions are based on the right principles of safety and health.
		24	조직의 관리자들은 직원들이 안전보건에 대한 좋은 결정들을 한다고 생각하고 있다. The managers of organization think that employees make good decisions about safety and health.
		25	직원들은 안전보건 관련 정책에 대한 관리자의 설명을 신뢰한다. Employees rely on managers' explanation on safety and health policies.
		26	조직 내에 상호 신뢰하는 분위기가 형성되어 있다. An atmosphere of mutual trust is formed within the organization.
		27	이 조직에서는 안전사고가 일어나지 않을 것이라 믿는다. I believe that no safety accidents will occur in this organization.
		28	직원들은 안전 규정을 반드시 지킨다. Employees always comply with the safety regulations.
	Competence	1	조직의 관리자들은 안전보건 관리에 대한 충분한 능력과 기술을 가지고 있다. The managers of organization have sufficient abilities and skills in safety and health management.
		2	조직의 안전보건 관리 기술에 대한 확신을 가지고 있다. I have confidence in the organization's safety and health management skills.
		3	조직은 안전/보건 관리 계획들을 이룰 수 있는 능력을 가지고 있다. The organization has the ability to achieve safety and health management plans.
		4	조직의 구성원들은 안전을 확보하면서 일할 수 있는 능력이 있다. The members of organization have the ability to work safely.
		5	조직의 구성원들은 경험을 통해 사고를 예방할 수 있는 방법을 학습한다. Members of organization learn through experience how to prevent accidents.
		6	조직의 안전보건 관리자가 사고 예방에 중요한 역할을 하고 있다. Safety and health managers in the organization play an important role in the prevention of accidents.
		7	안전보건 관리자의 현장 점검이나 평가가 안전보건 개선에 긍정적인 영향을 미친다. On-site inspection and evaluation by the safety and health manager has positive effects on safety and health improvement.
		8	조직의 구성원들은 안전보건 관련 교육, 훈련이 긍정적인 효과가 있다고 생각한다. The members of organization think that safety and health related education, training has positive effects.

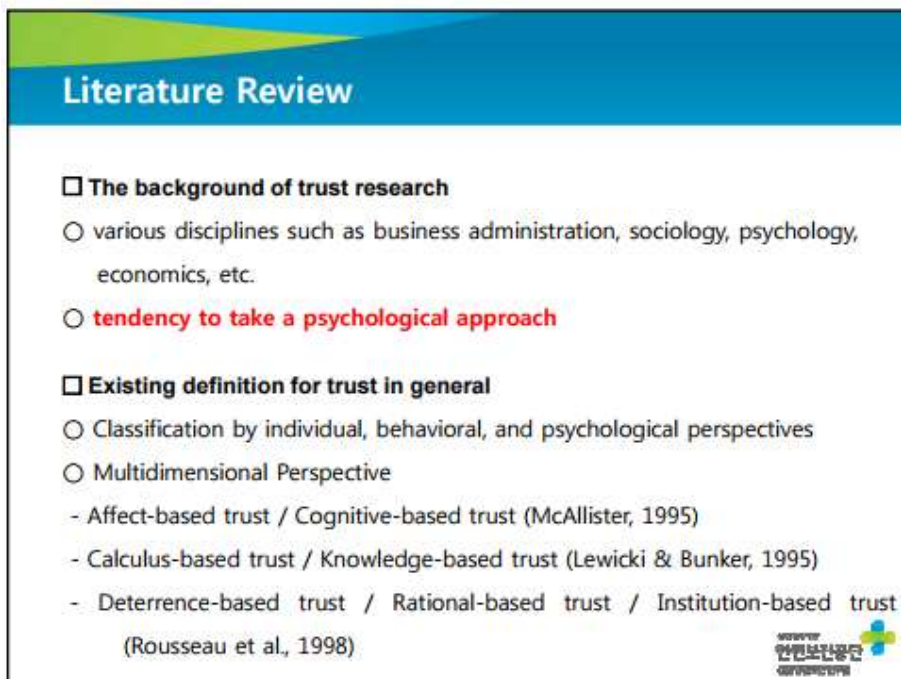
Confidence			The members of organization think that safety and health education and training have positive effects.
		9	조직의 신입사원 선발 과정에는 안전보건 관련 지식이나 태도를 평가하는 절차가 있다. The selection process for new employee in organization contained a process to evaluate safety and health knowledge and attitudes.
		10	조직은 안전보건 관련 지식이나 태도가 좋은 근로자들을 선발하고 있다. The organization selects workers with good safety and health knowledge and attitudes.
		11	조직은 신입사원이 안전하고 건강하게 근무할 수 있도록 체계적인 훈련, 교육을 제공하고 있다. The organization provides systematic training and education for new employees to work safely and healthily.
		12	다른 동료들의 부주의한 업무로 인해 내 일이 더 위험해지지 않을 것이라고 믿는다. I believe that my work will not become more dangerous because of the inattentive work of other colleagues.
		13	조직의 경영진들은 안전보건 문제를 해결할 수 있는 능력을 가지고 있다. The management of organization have the ability to solve safety and health issues.
		14	조직의 구성원들은 조직의 안전보건 목표 달성에 기여한다. The members of organization contribute to the achievement of the organization's safety and health goals.
		15	조직의 구성원들은 일을 안전하게 수행한다. The Members of organization work safely.
		16	조직의 구성원들은 안전하게 일하는데 매우 숙련되어 있다. The Members of organization are very skilled at working safely.
		17	조직의 대부분의 관리자들이 안전보건 관련 업무를 잘한다고 생각한다. I think most managers in the organization are good at safety and health work.
		18	새로운 직원들과 함께 일을 해야 하는 경우에도 안전보건 문제가 발생할 것이라고 걱정하지 않는다. If I need to work with new employees, I do not worry about occurring safety and health problems.
		19	관리자들은 조직 내 안전에 관한 풍부한 지식을 가지고 있다. Managers have a wealth of knowledge about organizational safety.
		1	조직에서 일하는 직원들은 안전을 위한 명확한 목표를 갖는 것이 중요하다고 생각한다. I thing it is important to have clear goals for safety to employees working in the organization.
		2	이 조직의 경영진은 안전보건과 관련된 명확한 방향성을 제시하고 있다. The management of organization has a clear direction on safety and health.
		3	직원들이 안전보건 관련 사안들을 합의하고, 합의한 사안들이 실현될 수 있는 효과적인 제도가 있다. An effective system in which employees can agree on safety and health issues and can be realized is existed in organization.

		4	조직은 안전보건 사항을 항상 확인하고 감독한다. The organization always monitors and supervises safety and health issues.
		5	조직은 직원들에게 안전보건과 관련된 정보를 제공하는 피드백 제도를 갖추고 있다. The organization has a feedback system that provides safety and health information to employees.
		6	조직의 직원들은 이 회사의 안전/보건 환경을 믿고 있다. The members of organization believe in the organization's safety and health environment.
		7	조직에는 지켜야 하는 안전 규칙이 확립되어 있다. The organization has established safety rules to keep.
		8	조직 내 설비 및 기기들은 전체적으로 안전하다. Facilities and equipment within the organization are generally safe.
		9	조직 내 위험을 방지하기 위한 안전 장비가 마련되어 있다. Safety equipment is provided to prevent workplace hazards.
Predictability		1	관리자들은 안전보건 관련 평가나 보상이 언제 주어질지 잘 알지 못한다. Managers do not know when safety and health assessments or rewards will be given.
		2	안전보건과 관련된 업무 수행이 어떻게 될지 예측이 된다. It is predicted how safety and health work will be done.
Consistency	Predictability	1	조직의 구성원들은 안전보건 사안과 관련하여 자신이 말한 대로 행동한다. The members of organization act as they say about safety and health issues.
		2	경영진들은 안전보건 관련 사안들에 대한 약속을 지킨다. Management keep the appointment to safety and health issues.
		3	관리자들은 안전보건 관련 사안들에 대한 약속을 지킨다. Managers keep the appointment to safety and health issues.
		4	조직의 구성원들은 안전보건 관련 사안이 정해지면 이를 준수하고 따른다. The members of organization will comply with safety and health rule when it set as a new.
		5	조직의 구성원들은 안전보건 사안을 대할 때 한결같이 이를 최우선으로 한다. Whenever the members of organization are treated in safety and health issue, this is always top priority.
		6	조직은 조직 내 설비 및 기기들을 정기적으로 검사한다. The organization regularly inspects equipment and devices within the organization.
Expectation		1	나는 이 조직을 위해 일하는 것이 자랑스럽다. I am proud to work for this organization.
		2	이 조직에서 일하는 직원들은 안전을 위해 사전에 계획을 세우는 것이 의미있는 것이라고 생각한다. Employees in this organization think it is meaningful to plan ahead for safety.
		3	나는 이 조직은 안전보건과 관련된 약속을 지킬 것이라고 생각한다. I think this organization will keep its appointment to safety and health.

		4	나와 내 동료들은 안전을 지키는데 관리자들이 도움을 줄 것으로 기대한다. I and my colleagues expect that managers will help to keep our safe.
		5	나와 내 동료들은 안전보건에 대한 노력에 대한 보상을 받을 수 있을 것으로 기대한다. I and my colleagues expect to be rewarded for our safety and health efforts.
		6	나와 내 동료들은 안전/보건에 대한 노력에 대한 인정을 받을 수 있을 것으로 기대한다. I and my colleagues expect to be recognized for their safety and health efforts.
		7	직원들은 이 조직의 안전보건에 대한 일관된 기대를 가지고 있다. Employees have consistent expectations about the safety and health of this organization.
		8	조직이 나의 안전보건에 대한 기대에 부응할 것이라고 믿는다. I believe that organizations will meet my safety and health expectations.
		9	나와 동료들은 조직이 안전보건에 대한 합의 사항을 이행할 것이라고 생각한다. I and my colleagues think that the organization will implement the safety and health consensus.
Care	Care	1	조직은 안전보건과 관련된 중요한 의사결정을 할 때 구성원들의 의견 요구를 고려한다. The organization considers the opinions and needs of its members when making important safety and health decisions.
		2	함께 근무했던 직원이 더 이상 함께 일하지 못하게 되면 모두 상실감을 경험할 것이다. If the employees who worked together can no longer work together, all will experience a sense of loss.
		3	조직 구성원들은 어떤 안전보건과 관련된 문제를 공유하면 건설적이고 지지적인 반응을 보일 것이다. The members of organization will show constructive and supportive responses when they share any safety and health related issues.
		4	조직 구성원들은 안전보건과 관련된 사안에 대해 상호 자유롭게 대화할 수 있다. The members of organization are free to communicate with each other about safety and health issue.
		5	조직 구성원들은 안전보건과 관련된 문제나 걱정을 이야기 하면 진지하게 받아들일 것이다. The members of organization will take it seriously if they talk about safety and health issues or concerns.
		6	조직 구성원들은 안전보건과 관련된 제안이나 문제를 경청한다. The members of organization listen carefully for suggestions or issues related to safety and health.
		7	경영진들은 직원들의 관점에서 안전보건과 관련된 일을 진행하려고 한다. Management seeks to do safety and health work from the perspective of employees.
		8	조직은 직원들의 안전보건과 관련된 사항에 신경쓰고 있다. The organization is concerned with the safety and health of employees.
		9	경영진들은 안전보건과 관련된 사안에 대해 직원들을 도와줄 수 있는 방법을 찾기 위해 노력한다. Management strive to find ways to help employees with safety and health issues.
		10	조직 구성원들은 직원들 안전보건 측면을 서로 진심으로 돌봐준다.

			The members of organization take a serious look at the safety and health aspects of their employees.
		11	조직 관리자들은 그들의 안전보건뿐만 아니라 직원들의 안전보건에도 관심을 가지고 있다. The managers of organization are concerned not only with their safety and health, but also with the safety and health of their employees.
Goodwill		1	경영진은 안전보건에 대한 직원들의 관점이나 의견을 진지하게 받아들인다. Management takes the perspectives and opinions of employees on safety and health seriously.
		2	경영진의 안전보건 정책 의도와 동기가 선하다고 생각한다. I think that management's safety and health policy intention and motivation are good.
		3	관리자가 안전보건에 대한 긍정적인 피드백을 준다면 나는 그 피드백을 그대로 받아들인다. If the manager gives positive feedback on safety and health, I accept that feedback.
		4	내가 안전보건 사안에 대해 실수를 한다면 주변 동료들과 관리자들은 용서해 줄 것이다. If I make a mistake about safety and health issues, colleagues and managers will forgive.
		5	안전보건에 대한 목표를 성취하기 위해 관리자들은 직원들을 따뜻하게 격려해준다. Managers warmly encourage employees to achieve their safety and health goals.
Transparency	Justice	1	조직의 안전보건 정책과 절차들은 윤리적인 측면을 충분히 반영하고 있다. The safety and health policies and process of the organization fully reflect the ethical aspects.
		2	경영진은 안전보건 관련 사안에 대해 솔직하고 숨기는 것이 없다. Management is honest and does not hide anything about safety and health issues.
		3	관리자들은 안전보건과 관련된 보상에 대한 정보를 솔직하게 공유한다. Managers frankly share information about safety and health compensation.
		4	경영진은 정의에 대한 인식을 가지고 안전보건 정책을 진행한다. Management carry out safety and health policies with a sense of justice.
		5	조직은 직원들이 불편하게 생각할 수 있는 안전보건 사안들도 사실대로 말한다. The organization also speaks to safety and health issues that employees may feel uncomfortably.
		6	조직은 안전보건과 관련된 모든 정보를 공개적으로 공유한다. The organization shares all safety and health information in public.
		7	경영진의 안전보건과 관련된 노력은 진실이다. Efforts related to safety and health of Management are the true heart.
		8	관리자들의 안전보건과 관련된 의사소통은 진실에서 우러난 것이다. Communication related to safety and health of managers is the true heart.
		9	관리자들은 안전보건 결과를 잘 보이기 위해 직원들에게 희생을 요구하지 않는다. Managers do not ask employees to sacrifice to result positive safety and health.
		10	관리자들은 안전보건과 관련된 책임을 직원들에게 돌리지 않는다. Managers are not shift safety and health responsibilities to employees.

			이 조직은 위험이나 사고에 대해서 숨기지 않는다. This organization does not hide risks or accidents.
		11	
Fairness		1	조직은 직원들의 안전보건을 관리하는 데 있어 공정하기 위해 매우 노력한다. The organization is very committed to fairness in managing the safety and health for employees.
		2	조직은 모든 직원들에게 같은 안전보건 규칙을 적용한다. The organization applies the same safety and health rules to all employees.
		3	조직은 구성원들을 공정하고 바르게 대한다. The organization treats its members fairly and politely.
		4	조직은 안전보건에 대한 의사 결정을 내릴 때 직원들의 의견도 들어준다. The organization also includes employees' opinions when making safety and health decisions.
		5	관리자들은 안전보건에 대한 다양한 의견에 경청한다. Managers listen carefully to various opinions on safety and health.
		6	나는 관리자들이 안전을 다루는 방식이 공정하다고 믿는다. I believe that the way managers handle safety is fair.
		7	나는 나의 일에 영향을 미칠 수 있는 안전보건 사안에 대한 발언권이 있다. I have the right to speak about safety and health issues that can be affected to my work.



- trust in the context of organization
 - Mayer et al.(1995)
 - Heimer(2001)
 - Rousseau et al.(1998)
- Trust relationship(trustor-trustee) or trust process
 - Control of trustor to trustee
 - **Vulnerabilities**
 - **Trustworthiness**(ability, integrity, benevolence)



- The factors based on organizational trust
 - Hart, Capps, Cangemi & Cailouet(1986) : Openness, consistency, **sharing organizational value**, autonomy
 - Mishra & Morrissey(1990): Open communication, **participation** in decision making, sharing important information, sympathy
 - Levering(2000): Integrity, individual respect, **fairness**, pride, fun
 - Lee(2003): procedural justice, organizational capacity, recognition and growth opportunities, consideration, morality, fairness of distribution, social contribution (Korean workers)
 - Lim(2004): Self-esteem, organizational atmosphere, personnel fairness, **executive capacity**, and care of workers (Korean workers)



○ The main feature of trust

- Dynamics: increase or decrease depending on time
- Irrelevance: difficulty in recovering if it is withdrawn
- Transactional: Exchange various types of resources
- **Mutuality**: existence of trustor and trustee
- Emotional effect: sometimes it is unconditional (blind) so when trust is broken, emotional impact and wounds can be affected.
- **Implicit**: action based on mutual consent, even if not explicitly expressed



Open-Ended Questionnaire

Variable	Factors	responded number
Trust	Rule compliance	21
	Communication	21
	Mutual trust	19
	Leadership	17
	Safety work environment	14
	Belief	13
	Respect	9
	Education	9
	Trust between manager and worker	7
	Appointment	6
Prevention	Prevention activity in advance	47
	Education	46
	Process compliance	14
	Risk perception	13
	Safety condition	13
	sharing and interest	12
	Life respect	11
	Work environment management	10



□ Example of impressive responses (centered on key words) related to Trust

- (Rule compliance) Keep the regulation, process, order, principle
- (Communication) Relationship with employer-employee (containing Labor union), talking for everything (feedback, mutual communication, communication for organizational level, not hiding)
- (Mutual trust) personal-personal, personal – manager – organization (management), belief itself, understanding, no doubt
- (Leadership) willingness of leader, communication, belief for leader, safety competency of leader, investment and policy from leader
- (Safety work environment) Safety for equipment, heavy machine, safety protection tool, inspection for all environment
- (Belief) cooperation with colleague, care, organizational culture based on love, human relationship, belief for no occurring accident



Operational Definition for trust in OSH

□ Process for developing "Trust leading indicator"

- The concept of trust in occupational safety and health
- Making a questionnaire or an indicator is a kind of standard procedure to collect a set of some behaviors or thoughts in particular area (Crocker & Algina, 1986)
- Making the definition of the constructive concept can be possible through existing literature review, interviews, open-ended questionnaire, or even direct observation



□ A few key points

- Concept of trust in the perspective of OSH based on the concept of preventive culture
- Trust that the safety-related behavioral characteristics can be reflected from the psychosocial perspective of individuals and organizations
- Trust should be able to tolerate the **vulnerability** of the other party, but it is based on the **positive trustworthiness** of the other party's **ability, information, belief** etc. for prevention of accidents.
- Trust that can be reflected in **mutual trust** in **communication, leadership, safety and health environment**, which should be treated as important in industrial safety and health,



□ Existing definition for safety culture

Shared set of safety-related **attitudes, perceptions, and behaviors** among individuals in an organization (Zohar, D., 1980)

Norms and rules for handling hazards, attitudes toward safety, and reflexivity on safety practice (Pidgeon, N. F., 1991).

A **shared** set of safety-related **attitudes, behaviors, values**, and **ingrained assumptions** that orient organizational action pertaining to safety (Schein, E. H., 1992).

The factors that determine an organization's (labor and management) commitment, style, and proficiency in ensuring safety that result from safety-related **beliefs, values, attitudes, competencies, and behavioral** patterns (Reason, J., 1997).



☐ Existing definition for safety culture (continue)

Normative beliefs and fundamental values, assumptions, expectations, philosophies, norms, and rules, with regard to safety at a workplace (Mearns, K. J., & Flin, R., 1999).

A set of safety related **attitudes, values or assumptions** that are **shared** between the members of an organization (Guldenmund, F. W., 2000).

An enduring characteristic of an organization that is reflected in its **consistent way** of dealing with critical safety issues (Wiegmann, D. A., Zhang, H., Von Thaden, T. L., Sharma, G., & Gibbons, A. M., 2004).

How an **organization values** the importance of safety, what the priorities of an organization are, how employees respond to emergencies during their work, and whether an organization puts safety at the highest level when doing business (Patankar, M. S., & Sabin, E. J., 2010).



☐ Definition for **Prevention culture** from last workshop(Dresden)

The concept of a culture of prevention describes safety and health as patterns in an organization (company, administration, education) **within society**. In the center of a culture of prevention stands the human being at **every stage of their life**.

Human and societal needs are the starting point for a culture of prevention.

A culture of prevention consists of **artefacts** (e.g. OSH Management **System**), espoused **values or attitudes** (e.g. OSH as a priority), perceptions and basic assumptions, that are often subconsciously (e.g. self-esteem). They are interrelated and impact human behavior and action.



□ Vision Zero and 7 Golden Rules

a transformational approach to prevention that integrates the three dimensions of **safety, health and well-being** at all levels of work.

1. Take **leadership** – demonstrate commitment
2. Identify hazards – **control** risks
3. Define targets – develop programmes
4. Ensure a safe and healthy **system** – be well-organized
5. Ensure safety and health in machines, equipment and workplaces
6. Improve qualifications – develop **competence**
7. Invest in people – motivate by **participation**



□ Operational definition of TRUST in OSH

- (English) As a sub-factor of preventive culture, trust in industrial health & safety is defined as the conscious and implicit mutual belief that individuals and organizations taking into account vulnerability of each other will strive for developing and maintaining a safe and healthy work environment for all workers – not only to protect the workers themselves from accident and illness but to prevent negative effects in the work environment from affecting their families and communities.

- (Korean) 산업안전 보건에서 신뢰란, 개인과 조직이 서로의 불완전성을 수용하면서 근로자와 그들의 가족, 그리고 공동체에 작업환경의 부정적인 영향이 미치지 않도록 안전하고 건강한 근로 환경을 개발, 유지하고자 노력할 것이라는 의식적이고 암묵적 믿음으로 정의한다.

- Trust in occupational safety and health as described above will help to establish a positive mutual interest that can contribute to workers' safety and health commitment and increase safety behavior and ultimately contribute to the prevention of industrial accident and disease.



Draft items by KOSHA

The opinion of DGUV	The opinion of KOSHA
Reliance	
Confidence	
Competence	Factor 1(ex.) : Reliance, Confidence, Competency
Cooperation	+ leadership
Reciprocity	Factor 2(ex.) : Cooperation, Reciprocity
Predictability	+ communication
Consistency	Factor 3(ex.) : Predictability, Consistency, Expectation
Expectation	+ Safety work environment
Care	Factor 4(ex.) : Care, Sharing, Goodwill
Fairness	+ Belief
Sharing	Factor 5(ex.) : Fairness, Transparency
Transparency	+ mutual trust
Goodwill	

Blue one is the factor from Open-ended questionnaire



☐ **Final expected factor classification with KOSHA opinion(idea)**

- Definition of prevention culture and safety culture
- The key factors from literature review
- the realistic of OSH such as Open-ended questionnaire
- Based on the operational definition of trust above, the following pre-draft items were constructed focusing on the main factors of the open-ended question and literature review.

-> **Last September, about 140 items developed(Appendix 2)**



☐ **Final draft items by KOSHA(October, 2018)**

○ **77 items (p. 9) (Cooperation, Trust, Predictability, Care, Just)**

- First version(Sep.) 140 items -> Second version(Oct.) 77 items

○ **Process**

1. Extract the related items from literature(Appendix 1)
2. Modified extracted items to match the prefactors of trust
3. reviewed for the modified items(about 140)
4. Minimized first items(140) to 77 items (repeated, or similar meaning items)

<Note> How to develop draft items (p. 17)



Pilot test by KOSHA (1)

□ The first result of exploratory factorial analysis

- Participants(total 354 Korean Workers / Survey : October, 2018)
 - Detail analysis of demographic (p. 18)
- Value of factor loading

Factor	Initial Eigenvalues			Rotation Sum of Squared Loadings		
	Total	% of Variance	Cumulative %	Total	% of Variance	Cumulative %
1	36.122	57.336	57.336	8.526	13.533	13.533
2	2.489	3.952	61.288	8.295	13.167	26.700
3	1.512	2.399	62.687	8.136	12.905	39.615
4	1.163	1.846	63.533	7.329	12.585	52.200
5	1.117	1.773	67.306	7.806	12.380	64.580
6	1.038	1.632	68.938			
7	.913	1.450	70.388			
8	.878	1.394	71.782			
9	.825	1.309	73.091			
10	.777	1.233	74.325			
11	.758	1.203	75.528			
12	.722	1.145	76.673			
13	.694	1.096	77.768			



○ Revised draft item after the first analysis

- It was **eliminated 14 items** which have less factor loading value(under .40) or overlapped with other factors or have a qualitatively a different meaning with the constructed factors.



□ The Second Results of Exploratory factorial analysis (p. 20~26)

- Finally, 5 factors were constructed such as named "Openness, Competence, Cooperation, Care, Fairness".
- Total Rotation Sums of Squared Loading was 65.96% in SPSS

□ Comparison between 'Pre' and 'After' by KOSHA

Pre-expected factors	Frequency of Items	After factorial analysis	Frequency of Items	Cronbach's α
Care	10	Openness	18	0.963
Cooperation	17	Competence	14	0.957
Justice	11	Cooperation	12	0.938
Predictability	11	Care	11	0.946
Trust				
※ Competence 11, Confidence 5, Reliance 12	28	Fairness	8	0.928
Total	77	Total	63	

The expected factor from DGUV (Reliance, Cooperation, Predictability, Competence, Care, Fairness)



Pilot test by KOSHA (2)

Criterion validity with safety and health issue (p. 27)

- Tools for criterion : Griffin & Neals, 2000; Zophar, 2000

Factors	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
1) Trust_Openness	1														
2) Trust_Competence	.818**	1													
3) Trust_Cooperation	.813**	.874**	1												
4) Trust_Care	.886**	.847**	.822**	1											
5) Trust_Fairness	.832**	.853**	.833**	.867**	1										
6) Safety_Value	.569**	.585**	.577**	.655**	.573**	1									
7) Safety_Communication	.677**	.722**	.703**	.706**	.641**	.635**	1								
8) Education_and_training	.661**	.729**	.726**	.707**	.641**	.582**	.760**	1							
9) Safety_system	.694**	.806**	.750**	.733**	.716**	.557**	.733**	.781**	1						
10) Safety_leadership	.555**	.570**	.596**	.612**	.553**	.581**	.643**	.552**	.566**	1					
11) C. B.	.649**	.633**	.635**	.619**	.623**	.477**	.516**	.525**	.568**	.482**	1				
12) P. B.	.668**	.652**	.645**	.631**	.613**	.462**	.551**	.567**	.600**	.492**	.809**	1			
13) R. P.	-.139*	-.071	-.064	-.134*	-.057	-.002	-.067	-.098	-.128*	-.145**	-.155**	-.131*	1		
14) D. A. E.	-.157**	-.057	-.055	-.126*	-.076	-.067	-.312*	-.109*	-.081	-.146**	-.119*	-.116*	.266**	1	
15) I. A. E.	-.113*	-.046	-.066	-.124*	-.085	-.099	-.122*	-.126*	-.071	-.120*	-.026	-.019	.148**	.489**	1

11) C. B. = Compliance Behavior, 12) P. B. = Participation Behavior, 13) R. P. = Risk Perception, 14) D.A.E = Direct Accident Experience, 15) I.A.E = Indirect Accident Experience





KOSHA-DGUV Follow up project on "Trust as a leading indicator for a culture of prevention"
On behalf of DGUV: Robert Gründler, Wissensimpuls & Dr Ulrike Bollmann, IAG

Last update: 15/12/18 – following December Meeting

Study on Leading Indicators for a Culture of Prevention

Developing a national culture of prevention, within the global aim of „Vision Zero“, requires leading indicators to guide the process. In Part I of the study, a Prevention Culture Index was developed, based on an international empirical pre-study (NN=840). In Part II of the study, the focus will be on investigating the leading indicator 'trust'. Trust forms the basis for relationships between people and between people and systems. Furthermore, trust offers a possible course of action in uncertain and complex situations which are not covered by formal rules or guidelines. The leading indicator trust allows predictions to be made regarding safe and healthy behaviour within a certain situational and organisational context.

The aim of the study is to equip national and multinational companies and institutions with a scientifically based Trust-Assessment. The research project is being jointly conducted by the Institute for Work and Health (IAG) of the German Social Accident Insurance (DGUV) and the Korea Occupational Safety and Health Agency (KOSHA), supported by other research institutes.

Trust as a core mechanism for the development of a culture of prevention

The project on leading indicators for a culture of prevention follows a cultural approach to prevention. A cultural approach to prevention is necessary because of the change of work. The core of a culture of prevention are personal relationships. To be able to "manage" the social relationships will be decisive for a company to survive in future. Safety and health are socially constructed, that means the meaning of safety and health is created within these social relationships and depends on the (situational) context. To predict the development of a culture of prevention will be possible with the help of five categories and there corresponding leading indicators: leadership, communication, participation, learning process and trust. According to a comprehensive understanding of prevention our leading indicators shall not only be able to predict how to avoid risks, but also to predict a safety and health outcome based on what works well (Safety II – Holtnagel) (Bollmann, Lee, Seo, Paridon, Kohstall, Hessenmöller, & Bochmann, in preparation).

KOSHA-DGUV Follow up project on "Trust as a leading indicator for a culture of prevention"
On behalf of DGUV: Robert Gründler, WissensImpuls & Dr Ulrike Bollmann, IAG

Last update: 15/12/18 – following December Meeting

<i>Definition</i>	<i>The concept of a culture of prevention describes safety and health as patterns of an organization (company, public administration, educational institution) within a social context. In the center of a culture of prevention stands the human being at every stage of their life.</i>				
<i>Category & description</i>	<i>Leadership</i>	<i>Communication</i>	<i>Learning Process</i>	<i>Participation</i>	<i>Trust</i>
	The category leadership covers the policy of an organization (corporate governance) and the management of an organization with a focus on safety and health.	The category communication covers the flow of information, the transfer of knowledge and the process of interaction and communication within an organization with an impact on safety and health.	The category learning process covers formal and informal learning processes to achieve individual and organizational competencies and capabilities on safety and health. In principle learning is (based on) experience.	The category participation covers the active engagement of individuals or organizations (stakeholder) into the design and development of prevention, as well as their disengagement.	Trust forms the ground for the development and the success of interpersonal and organizational relationships. Trust is the core-mechanism for work. Trust ensures the possibility to act in face of an increase of complexity.
<i>Leading indicator</i>	Policy of an organization (Corporate Governance)	Transparency of information and knowledge	Formal learning processes	Creating opportunities for (organized) participation	Interpersonal trust
	Leadership & Commitment	Mutual feedback	Informal learning processes	Social Dialogue (as a process)	Institutional trust

KOSHA-DGUV Follow up project on "Trust as a leading indicator for a culture of prevention"
On behalf of DGUV: Robert Gründler, WissensImpuls & Dr Ulrike Bollmann, IAG

Last update: 15/12/18 – following December Meeting

Leadership style	Creating positive human relationships	Safety competence	Realization of participation	Fairness
------------------	---------------------------------------	-------------------	------------------------------	----------

Table 1: Leading Indicators for a Culture of Prevention (Bollmann et al., in preparation)

The follow up project on the category "trust" has its focus on the leading indicators "Interpersonal trust" and "institutional trust" and "fairness". Interpersonal trust within organizations covers two dimensions: trust in superiors and trust between employees (human interactions). Institutional trust refers to the interaction between humans and the system, for example trust in an OSH management system or trust in (automated) systems or any impersonal structure (Schöbel 2009, 318ff.). According to Schöbel safety research has rarely focused on the effects of institution-based trust (Schöbel 2009, 320). Digitalization may have an impact on both trust relations, human interactions (e.g. working within virtual teams) and human-system interactions (e.g. working within a virtual or augmented reality).¹

Regarding the category "trust" we differentiate between an understanding of interpersonal trust as "to rely on" and an understanding of trust in the sense of "confidence". The understanding of trust as "to rely on" represents an instrumental approach to trust: We trust to be able to achieve something, e.g. a certain benchmark. Trust here is "so called trust" ("trust"). This kind of trust is related to functioning, control, and calculation (Abdelhamid 2018). That's why Conchie and Donald call it "functional trust" (Conchie et al. 2006; Conchie & Donald 2007). Its more explicit, looking for reasons to be able to trust (rationality in a narrow sense; thought, intention, notion). Trust here means our "doing". Trust in the understanding of "confidence" is called "genuine trust" by Abdelhamid. Its more implicit, represented for example by radical openness (reason, mindfulness), including sensation, feelings). Trust here means our "being". McAllister differentiates between cognitive and emotional based trust (McAllister 1995), whereas Abdelhamid asks for an understanding of trust as an own kind of rationality. Such a rationality may help us to answer the question: How would we like to work and live in future?

¹ The topic how trust can be developed and maintained under the conditions of new forms of communication is examined by the research training group 1712/2 "Trust and Communication in a Digitized World" of University of Muenster, Germany: <https://www.uni-muenstl.er.de/GK-Vertrauen-Kommunikation/en/index.html> ..

KOSHA-DGUV Follow up project on "Trust as a leading indicator for a culture of prevention"
On behalf of DGUV: Robert Gründler, WissensImpuls & Dr Ulrike Bollmann, IAG

Last update: 15/12/18 – following December Meeting

Overview KOSHA – DGUV Follow up project on „Trust“ (state 18 October 2018)

No	Step	KOSHA	IAG/WissensImpuls
1	Literature study: Analysis of practices of trust	15 studies / 151 trust practices	33 studies / 96 trust practices
2	Pilot study	Survey of 140 people based on an open questionnaire on their understanding of trust and prevention (workers and safety professionals) Factors with the highest weighting: <ul style="list-style-type: none"> - Rule compliance - Communication - Mutual trust - Leadership - Safe working environment 	
3	Theoretical foundation	Definition of trust	Development of a framework model for trust based on Schein, 2004 (1985) and Abdelhamid, 2018
4	Identification of factors	Five factors: <ol style="list-style-type: none"> 1. Cooperation 2. Trust 3. Predictability 4. Care 5. Justice 	Five factors: <ol style="list-style-type: none"> 2. Cooperation 3. Predictability 4. Competence 5. Care 6. Fairness

KOSHA-DGUV Follow up project on "Trust as a leading indicator for a culture of prevention"
On behalf of DGUV: Robert Gründler, Wissensimpuls & Dr Ulrike Bollmann, IAG

Last update: 15/12/18 – following December Meeting

5	Content of factors	Clarification of the five factors on the assignment of further factors from the literature analysis: Cooperation, Reciprocity, Sharing, Reliance, Competence, Confidence, Predictability, Consistency, Expectation, Care, Goodwill, Transparency, Fairness	Description of the factors in three dimensions: 1. System/process 2. Behavior 3. Values/attitudes = Development of an evaluation catalog for assessors
6	Developments of items	Development of 126 items based on trust practices for all factors	General description of each factor plus description of observable specifications of each factor at three different levels: (a) Systems and processes, (b) behavior, and (c) values and attitudes
7	Further development of the evaluation catalog for assessors in companies		Further development of the evaluation catalog for assessors in cooperation with one or two pilot companies preferably located in Germany and the Republic of Korea (contact BASF, AUDI, ZÜBLIN, local company); Development of items for the company-specific questionnaire
8	International expert workshop	Yes	Yes
9	Survey – Level 1	1. Test the questionnaire in one of the countries 2. Factor Analysis 3. Definition of a common questionnaire	Test of the evaluation catalog as part of a business workshop Identification of artifacts and verbalizable attitudes and values
10	Survey – Level 2	Representative survey in both countries	Survey throughout the company at the location(s) in Germany

KOSHA-DGUV Follow up project on "Trust as a leading indicator for a culture of prevention"
On behalf of DGUV: Robert Gründler, WissensImpuls & Dr Ulrike Bollmann, IAG

Last update: 15/12/18 – following December Meeting

			= Gap analysis and, if necessary, factor analysis Comparison with the survey results of KOSHA; It would be ideal if the same company in Korea could be interviewed
11	Survey – Level 3	Analysis of the cultural differences ²	Workshop in the company (at both locations?)
12	Publication of the study	IAG Report; SH@W, Safety Science	

Table 2: Overview of the KOSHA – DGUV project (state: October 2018)

One outcome of the project (DGUV) will be a Trust Assessment (TA) consisting of an evaluation catalog for assessors and a questionnaire for an employee survey. The assessment will be conducted in three steps: (1) Identifying organization specific trust practices, (2) Identifying gaps between implemented and valued trust practices and (3) Identifying assumptions and patterns behind the gaps (Schoebel 2017). The aim of the TA is to describe the necessary conditions to grow.

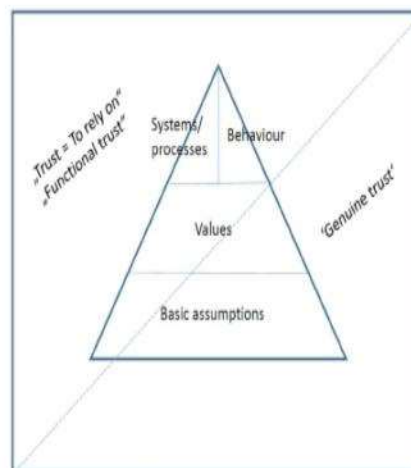
² Since the intercultural comparison is a challenging project of its own, the award of a doctoral thesis should be obtained for this purpose.

KOSHA-DGUV Follow up project on "Trust as a leading indicator for a culture of prevention"
On behalf of DGUV: Robert Gründler, WissensImpuls & Dr Ulrike Bollmann, IAG

Last update: 15/12/18 – following December Meeting

Trust-Framework

The theoretical foundation of the project is a "Trust-Framework" based on Edgar Schein's model of organizational culture (Schein 1985, 1990).



Regarding the category "trust" we basically differentiate between the following forms of trust and their subordinated forms:

- (a) Functional trust (rule-based trust (Jeffcott, Weyman, Pidgeon, & Walls 2006), competence-based trust covering deterrence-based trust, knowledge-based trust and calculus-based trust (Dietz & Den Hartog 2006, 6; Conchie et al. 2006; Conchie & Donald 2007)).

KOSHA-DGUV Follow up project on "Trust as a leading indicator for a culture of prevention"
On behalf of DGUV: Robert Gründler, WissensImpuls & Dr Ulrike Bollmann, IAG

Last update: 15/12/18 – following December Meeting

Functional trust is important, because of the need to rely on others and to cooperate and commit to organizational values and goals (Belland 2008, 26). On the other hand, rule-based trust may hinder the development of a culture of prevention (Belland 2008, 65): "Rule-based trust can be described as a 'taken for granted' type of trust. Rule based trust reduces alertness to possible incidents that may happen" (Jeffcott et al. 2006) and may end up as "dysfunctional trust". This kind of trust may prevent development of a good safety (and health) culture (Belland 2008, 25).

- (b) Relational forms of trust (benevolence and integrity based trust covers genuine trust (Abdelhamid 2018) and identification based trust (Dietz & Den Hartog 2006, 6)).

In reviewing research on safety and trust, Conchie & Donald (2008, 101) emphasize the importance of benevolence and integrity / value based trust for the development of shared safety values and attitudes. They contrast the safety-specific function of competence-based trust against trust based on integrity and benevolence. Relational forms of trust (benevolence and integrity based trust) have more positive effects on safety than its rational form (competence-based trust) (Schöbel 2009, 319).

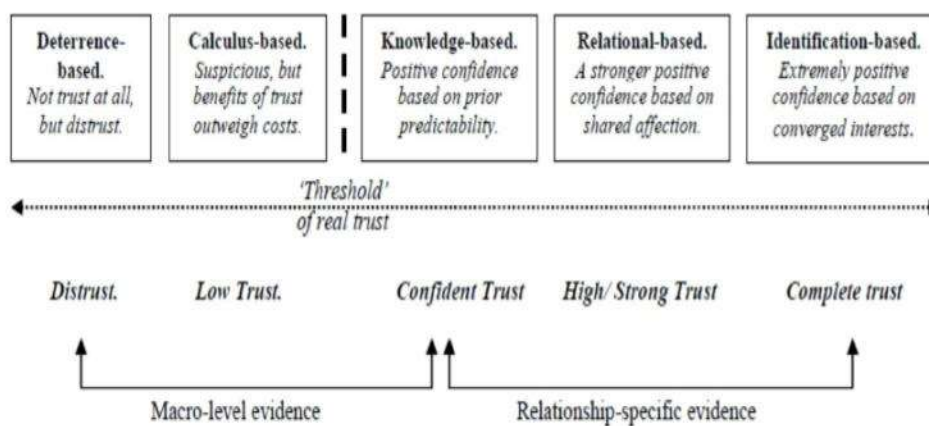
Operational definition of trust (state 15 December 2018)

Trust refers to positive expectations about others. Trust is based on beliefs but also on intentions to act. It can be differentiated between two fundamental types of trust: functional trust (explicit; looking for reasons to trust) and relational trust (implicit; based on benevolence). Determining factors of trust are: cooperation, predictability, competence, care and fairness. Trust has a positive effect on safety and health at work.

KOSHA-DGUV Follow up project on "Trust as a leading indicator for a culture of prevention"
On behalf of DGUV: Robert Gründler, WissensImpuls & Dr Ulrike Bollmann, IAG

Last update: 15/12/18 – following December Meeting

Figure 1: THE CONTINUUM OF DEGREES OF INTRA-ORGANISATIONAL TRUST.



(Dietz & Den Hartog 2006, 6)³

³ It will have to be decided if it is necessary to include this figure.

Identification of trust factors based on the literature review on trust practices

The evaluation catalog includes five trust factors derived from the literature. The focus of the literature review was on the identification of practices of trust. Both organizations, KOSHA and DGUV, identified five trust factors. The five factors are:

1. Cooperation
2. Predictability
3. Competence
4. Care
5. Fairness⁴

Evaluation catalog for assessors

The following catalog gives a general description of each factor. Following the general description observable specifications of each factor are described at three different levels: (a) Systems and processes, (b) behavior, and (c) values and attitudes (Fahlbruch, Schöbel, & Marold 2012). With the help of this catalog it shall be possible to identify organization specific trust practices within a company. Based on this a company specific questionnaire for an employee survey will be developed.

⁴ According to Dietz & Den Hartog three of these factors are measurable: Predictability, Competence and Fairness (2006, 13). According to Delahaye-Paine these three factors are: Competence, Integrity, Dependability/Reliability (2013, 6).

1. Cooperation⁵



"Together we are strong"

Trust and cooperation are intimately linked concepts (Gächter, Herrmann, & Thöni 2004, 508). To cooperate means acting together for a common, mutual benefit (reciprocity / togetherness). Cooperation is opposed to working in competition for selfish benefit. Cooperation is one of the mediators between interpersonal trust and group performance (Dirks 1999, 9).

Systems / processes	Behavior	Values / attitudes
1AS1 There is a systematic process to organize the exchange of documents / information, knowledge and experience between different units or parts of the organization (Q71)	1AB1 Members of the organization at different levels are involved in the exchange of resources 1AB2 The cooperation between different units or parts of the organization takes place at eye level (Q33) 1AB3 Members of the organization freely share ideas, feelings and hopes	1AV1 Cooperation between different units or parts of the organization is important 1AV2 Competences are more important than positions in the hierarchy 1AV3 Cooperation is considered as an important/significant part to achieve results (Q34)

⁵ The key-factor cooperation has been crosschecked between KOSHA and DGUV on 14 December 2018.

KOSHA-DGUV Follow up project on "Trust as a leading indicator for a culture of prevention"
On behalf of DGUV: Robert Gründler, WissensImpuls & Dr Ulrike Bollmann, IAG

Last update: 15/12/18 – following December Meeting

	1AB4 Members of the organization help each other (Q30)	1AV4 Cooperation and not competition is the shared pattern of interaction within the organization
1BS1 The organization provides open spaces (e. g. meeting corners, time for cooperation, projects that involve different units, production teams) for cooperation	1BB1 Members of the organization use the provided spaces to cooperate 1BB2 Members of the organization promote spaces for cooperation	1BV1 Interdisciplinary and cross-functional work is important 1BV2 Belief in the design of learning and working space
1CS1 A constructive approach to problems and conflicts is a topic in guidelines or training programs	1CB1 Members of the organization openly speak about difficulties and conflicts, even it could mean a disadvantage to them (Q65, Q66, Q69) 1CB2 Members of the organization are looking for solutions that balance between different parties of the problem or conflict	1CV1 Problems and conflicts need to be discussed frankly and can be solved 1CV2 Consensus has a priority (Q52)
1DS1 The organization follows the concept of shared leadership in leadership development processes (Drescher, Korsgaard, Welp, Picot, & Wigand 2014)	1DB1 Superiors share responsibilities within their teams 1DB2 Superiors decide together with their teams 1DB3 Superiors are open and up front with their teams	1DV1 Distribution of leadership within a team improves performance 1DV2 It is important to get involved into decisions (Q51) 1DV3 Interaction among superiors and employees is positive

KOSHA-DGUV Follow up project on "Trust as a leading indicator for a culture of prevention"
On behalf of DGUV: Robert Gründler, WissensImpuls & Dr Ulrike Bollmann, IAG

Last update: 15/12/18 – following December Meeting

1ES1 The organization provides possibilities for networking (internally / externally)	1EB1 Members of the organization network 1EB2 Members of the organization involve internal and external partners in their work 1EB3 Members of the organization promote networking	1EV1 Networks and networking are important
1FS1 There are structures that balance different interests between units, hierarchy levels or subgroups	1FB1 Members of the organization interact and communicate openly between different units, hierarchy levels or subgroups	1FV1 Balance between different interests is important
1GS1 There is an incentive system that includes aspects of cooperative behavior	1GB1 Members of the organization demonstrate cooperative behavior	1GV1 It is worthwhile to act cooperatively

2. Predictability



"Trust in another's intentions"

Predictability is a constituent element of trust (Dirks 1999, 8). Knowing someone's intention to trust is a strong predictor of future behavior and helps to assess the other's consistency and reliability. Nevertheless the theoretical and practical limitations of predictability have to be taken into account, especially in face of a world of work that is characterized by contingency, discontinuity, disruption and change.

Systems / processes	Behavior	Values / attitudes
Written rules for safety and health exist	<p>Rules are respected by the employees</p> <p>Rules are respected by the superiors</p> <p>The rules for safety and health are consistently and consciously respected under difficult conditions (such as time pressure)</p>	<p>It is important for the superior that rules are adhered to / followed</p> <p>Employees think that rules are important</p> <p>Employees see rules as something they are responsible for</p>
The decision processes within the organization are based on facts and standards	Superiors use decision processes for their own decisions	It is important for the superiors that decisions are based on facts and standards

KOSHA-DGUV Follow up project on "Trust as a leading indicator for a culture of prevention"
On behalf of DGUV: Robert Gründler, WissensImpuls & Dr Ulrike Bollmann, IAG

Last update: 15/12/18 – following December Meeting

There are procedures to systematically involve employees in the development, evaluation and adaptation of rules	Employees flexibly adapt rules to a context and a situation	It is important for the employee to adapt to a context and situation
	Employees actively participate in the development of rules	It is important for the superiors that employees actively participate in the development, evaluation and adaptation of rules
	Superiors and employees are regularly questioning the rules	Superiors and employees rate change as something positive
There is an open dialogue about informal rules	Employees openly speak about informal rules (cultural differences due to e.g. different professions, nationalities)	Superiors think that personal contacts between people are important for the organization Superiors and employees see the significance of informal rules for the work climate and the organizational success
Change is a relevant aspect of the whole management system (management of uncertainty)	Superiors talk openly about change	Employees and superiors are open for change
	Superiors and employees regularly talk about change in their units or parts of the organization	Employees and superiors see change as something positive
There are instructions for critical situations (emergency plan, responsibilities)	Employees follow the instructions in critical situations	Employees consider themselves capable of mastering critical situations
	Employees practice to master critical situations (e.g. emergency exercises)	

3. Competence



"You have to be competent to be trusted." (DeSteno) (O'Hara 2014)

An individual's trust may be based on the trustee's competence (ability or capability) to act as expected (Schöbel 2009, 318). Competence refers to the other party's capabilities to carry out her/his obligations (in terms of skills, knowledge and responsibility) (Dietz & Den Hartog 2006, 4; Bollmann 2018, 124). Too much trust in competence may reduce people's alertness and may hinder the development of a good safety and health culture (Belland 2008, 65).

Systems / processes	Behavior	Values / attitudes
The organization has a human resource development system that is open for individual development (set your own target, to work on one's own responsibility)	<p>Superiors are committed to the individual development of employees</p> <p>The employees are interested in their individual development</p> <p>There is a working atmosphere in which all employees can develop freely and realize their potential</p>	It is important for the superiors that employees develop their skills, knowledge, social and personal competences

KOSHA-DGUV Follow up project on "Trust as a leading indicator for a culture of prevention"
On behalf of DGUV: Robert Gründler, WissensImpuls & Dr Ulrike Bollmann, IAG

Last update: 15/12/18 – following December Meeting

	<p>Employees use the possibilities to develop their own skills, knowledge, social and personal competences</p> <p>Superiors promote and employees conduct Job Rotation</p> <p>Superiors promote and employees conduct Job Enlargement</p> <p>Superiors promote and employees conduct Job Enrichment</p>	
Access to information, support, resources and opportunities is possible (Structural empowerment (Kanter 1993))	Superiors and employees take responsibility for the design of their living and working environment	Superiors and employees believe in their capacity to make a difference with their own activities
There is a system that makes individual competences transparent (e. g. competence profiles)	<p>Employees make themselves aware of their own competences</p> <p>Superiors make themselves aware of the competences in their teams</p> <p>Employees show safety competence (e.g. follow the rules and dynamically adapt the rules to context and situation)</p>	<p>Competences in safety and health are highly valued within the whole organization</p> <p>Individual beliefs fit into the context (cultural congruity)</p> <p>Employees rely on co-worker's safety and health competence</p>

KOSHA-DGUV Follow up project on "Trust as a leading indicator for a culture of prevention"
On behalf of DGUV: Robert Gründler, WissensImpuls & Dr Ulrike Bollmann, IAG

Last update: 15/12/18 – following December Meeting

	<p>Employees show health competence (e.g. health related self-awareness and actively taking responsibility for one's own and the health of others)</p> <p>Employees generously participate with their competences</p>	
There is a system of personnel selection that considers safety and health competences	Superiors consider safety and health competences in their personnel decisions	Safety and health competences are high values in personnel decisions
There is a system that supports competence development of employees and superiors (e. g. objective agreements, training programs) and organizational competence as well	<p>Employees take their targets seriously</p> <p>Employees attend training programs</p> <p>Superiors speak about competence development e.g. in appraisal interviews</p>	<p>Professional and personal development is important for employees and superiors</p> <p>Learning has a positive meaning for the individual</p> <p>Organizational learning has a positive meaning</p>
There is a system that matches individual competences and tasks	<p>Employees appraise their competences realistically</p> <p>Superiors take care for the fitting of competences and tasks</p> <p>Promotion follows individual competences</p>	Individual competence is a high value within the whole organization
There is a system to deal with employee's recommendations or complaints	Employees openly speak about recommendations or complaints	Recommendations and complaints are seen as something positive

KOSHA-DGUV Follow up project on "Trust as a leading indicator for a culture of prevention"
On behalf of DGUV: Robert Gründler, WissensImpuls & Dr Ulrike Bollmann, IAG

Last update: 15/12/18 – following December Meeting

	<p>Superiors support an open dialogue about recommendations or complaints</p> <p>Superiors systematically analyse recommendations and complaints</p>	
--	------------------------------------------------------------------------------------------------------------------------------------------------------	--

4. Care



"Concern and goodwill builds trust"

Care describes a relationship of human beings to their environment and to themselves characterized by anticipatory benevolence. Benevolence-based trust refers to the trustee's concern and goodwill (Schöbel 2009, 318).

Systems / processes	Behavior	Values / attitudes
There exists an „Early Warning System“ in the daily practice of the organization: awareness and vigilance for human needs or dangers by everyone	<p>Superiors respond caringly when employees share their problems</p> <p>Supervisors and employees have the willingness and courage to approach others</p>	<p>Believe in good intention of other people</p> <p>Superiors are concerned about their employees as human beings (work and private life)</p>

KOSHA-DGUV Follow up project on "Trust as a leading indicator for a culture of prevention"

On behalf of DGUV: Robert Gründler, WissensImpuls & Dr Ulrike Bollmann, IAG

Last update: 15/12/18 – following December Meeting

	Superiors create a welcoming atmosphere for others	Employees are concerned about their colleagues (and superiors) as human beings (work and private life)
There exists a health care system (Addiction / Burnout / Bullying / Return To Work)	Superiors involve the authorized representative at an early stage Superior act together with the authorized representative	The authorized representatives feel valued and their work is appreciated
There are established procedures for assistance in special situations (long illness, child rearing, dependent relatives)	To stand to someone in bad times To take side in case of conflict; to represent those who are concerned For special problems also individual solutions are agreed	Superiors feel socially responsible Employees feel socially responsible
Rituals of mutual appreciation / recognition are institutionalized (for example, through campaign, common celebrations, honors, bouquet, certificate)	Most of the superiors and employees are actively involved in the institutionalized rituals	For the superiors and employees the institutionalized rituals are important

KOSHA-DGUV Follow up project on "Trust as a leading indicator for a culture of prevention"
On behalf of DGUV: Robert Gründler, WissensImpuls & Dr Ulrike Bollmann, IAG

Last update: 15/12/18 – following December Meeting

5. Fairness



"The belief that an organization is fair and just builds trust."

Fairness is closely linked with justice. In addition to formal equality before the law, fairness includes the equality of conditions that allow everyone, regardless of age, gender and background, to freely and optimally develop their potential. That something is considered fair and just depends on the congruence of values between the individual and his group or organization. In this context we also talk about value-based trust. Value-based trust relates to "integrity". Integrity involves adherence to a set of principles acceptable to the other party, encompassing honesty and fair treatment, and the avoidance of hypocrisy (Dietz & Den Hartog 2006, 4). Spreitzer and Mishra prefer "openness" (1999) instead of integrity.

Systems / processes	Behavior	Values / attitudes
<p>Corporate policy refers to universal standards, e.g. by</p> <ul style="list-style-type: none"> - Participation in the UN Global Compact, - Formulation of company-specific rules (e.g. Labor Rights Charter - Adidas, Business Conduct Guidelines - Infineon / Siemens) - own programs (eg Zero Harm - Siemens, Work-Life-Integration - Adidas, well-being @ work - Infineon) (Bochmann 2015) 	<p>The management not only develops rules but also a policy for decent work</p>	<p>Universal (supra-individual and cross-cultural) principles and values are important</p> <p>All human beings are equally entitled to their humanity and these rights are universal, inalienable and indivisible (Universal Declaration of Human Rights of the United Nations (Resolution 217 A (III) of the General Assembly of 10 December 1948))</p> <p>Human dignity is inviolable</p>

KOSHA-DGUV Follow up project on "Trust as a leading indicator for a culture of prevention"
On behalf of DGUV: Robert Gründler, WissensImpuls & Dr Ulrike Bollmann, IAG

Last update: 15/12/18 – following December Meeting

		Decent work is a human right Employees believe that their values are connected to the values of the organization (Q32)
Justice and fairness are agreed in the company principles	No one in the company is discriminated against on grounds of age, gender or origin Fairness is lived in the company by executives and employees The employees work in a working environment in which they can live their values (Hans-Horst Konkolewsky in Bochmann 2015, approx. 40)	It is important to superiors that all employees have the same opportunities Diversity is important for the success of the whole organization Superiors believe that all workers, regardless of their form of employment, must be treated equally
Rules for safety and health apply to all employees regardless of the form of employment	Superiors instruct all employees, regardless of the form of employment All employees, regardless of the form of employment, are involved in occupational safety measures All employees, regardless of the form of employment, are involved in health promotion measures	For executives, it is important that the same OSH level be achieved for all employees, regardless of the type of employment

KOSHA-DGVU Follow up project on "Trust as a leading indicator for a culture of prevention"
On behalf of DGVU: Robert Gröndler, WissensImpuls & Dr Ulrike Bollmann, IAG

Last update: 15/12/18 – following December Meeting

There is a well-founded CSR concept that explicitly refers to safety and health	<p>There is voluntary social responsibility within and outside the core business: cultural sponsorship, corporate volunteering, cause related marketing, "Doing good"</p> <p>Attention is paid to lawful and normative behavior in order to avoid misconduct in the context of the entire value added: code of conduct, compliance, employee training, working standards at suppliers ("avoiding bad") (Nick Lin-Hi 2018)</p>	<p>Companies have a social responsibility</p> <p>The social conditions have an influence on safety and health at work (Walter Eichendorf in Bochmann 2015)</p>
There are measures for socially responsible work: employees have a chance to reach the level of safety and health at work in their private lives as well (Walter Eichendorf)	<p>The manager understands the work-life balance with respect for the special requirements of private life</p> <p>The manager understands young parents as well as older and foreign employees</p>	<p>Man is more than his "commodity" labor</p> <p>"The human being is the center of attention, not only as a worker, as 'human capital', but as a whole person together with his social (Hans-Horst Konkolewsky in Bochmann 2015).</p> <p>Employers and employees have a common responsibility in occupational safety, which goes further than the letters and paragraphs in the law" (Hans-Horst Konkolewsky in Bochmann 2015)</p>
There are measures to specifically ensure the participation of disabled people in the work process	The management initiates construction measures to facilitate access for the disabled	People with disabilities belong to us; are one of us (principle of inclusion).

KOSHA-DGUV Follow up project on "Trust as a leading indicator for a culture of prevention"
On behalf of DGUV: Robert Gründler, WissensImpuls & Dr Ulrike Bollmann, IAG

Last update: 15/12/18 – following December Meeting

(accessibility for the disabled, sufficient opportunities for movement and support in the workplace as well as rehabilitation and return to work measures (Bochmann 2015, 43f.))	<p>The manager supports employees with disabilities in the work process</p> <p>Employees with disabilities benefit from this support</p>	<p>The perspective of people with disabilities deserves special attention (UN Convention on Human Rights 2006, concretisation and specification of universal human rights from the perspective of people with disabilities against the background of their life situations).</p>
There is organized an open dialogue about values	<p>The values of the company are communicated openly on all levels</p>	<p>Superiors and employees belief that there is a common ground of values within the whole organization</p> <p>It is important for the superiors and the employees that there is a common ground of values</p> <p>Safety and health is perceived as inherent values of the company</p> <p>There is a commitment to the values of the company</p>

별첨 3

Factor Matrix

Example on how to connect TA and
questionnaire

Factor: Cooperation

	Relational				Functional		
	System/Process	Behavior	Value/Attitude		System/Process	Behavior	Value/Attitude
Systematic process to exchange info		1AB2; 1AB3; 1AB4			70; 71; 74; 1AB1	28	1AV1
Constructive approach to communication (speaking about problems)	1CS1	65; 66; 69; 1CB1; 1CB3	52; 1CV1; 1CV2				
Cooperation culture		30	32; 34 1AV3; 1AV4		1FS1	1FB1	33
Ressources for cooperation	1BS1	1BB1; 1BB2					1BV1; 1BV2
Leadership	1DS1	1DB1; 1DB2; 1DB3	51; 1DV3; 1DV1; 1DV2				
Networking					1ES1	1EB1; 1EB2; 1EB3	1EV1
Incentives					1GS1	1GB1	1GV1

State: 14 December 2018