

# Structural Stability Assessment Technology

Dr. Jeongwoo Han  
Department of Smart Industrial Machine Technologies  
T. +82 - 42 - 868 - 7432  
E. jwhan@kimm.re.kr

- ⇒ Structural analysis/design technology
- ⇒ Fatigue analysis and life assessment technology
- ⇒ Structural Safety test and assessment technology (Static/dynamic load test, fatigue and endurance test)

## Client / Market

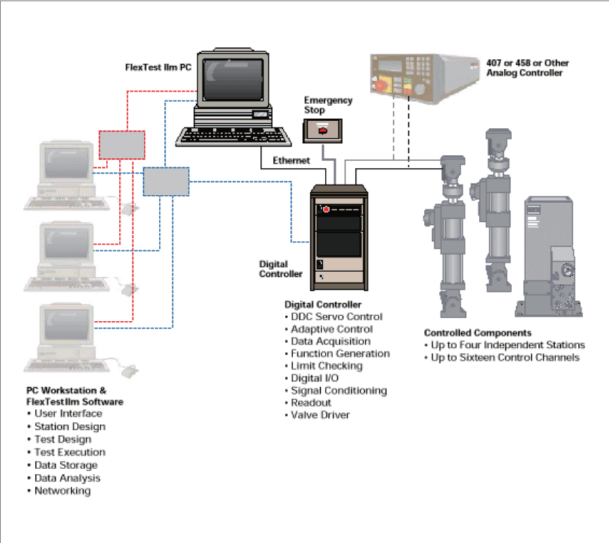
- Railroad car
- Construction machine /agricultural machine
- Defense industry (armored car, tank, etc.)
- Aircraft

## Necessity of this Technology

- Safety, reliability, and weight reduction of the structure through the structural test and assessment

## Technical Differentiation

- Static load, dynamic load, fatigue load test for large full-scale structure
- 50 ton, 100 ton UTM
- Reaction test bed: 25 m(L)×12 m(W)×1 m(T)
- Reaction test wall: 25 m(L)×8 m(H)×1 m(T)
- Structural bearing capacity: 1,000 ton (distributed), 100 ton (point)
- Digital controller (FlexTest 200, 2 sets): Simultaneous control of 20 actuators each station (8 stations)



## DESIRED PARTNERSHIP

Technology Transfer

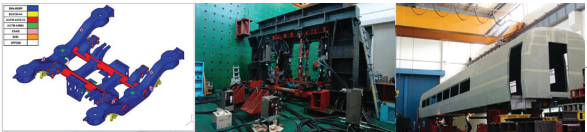
Licensing

Joint Research

Other



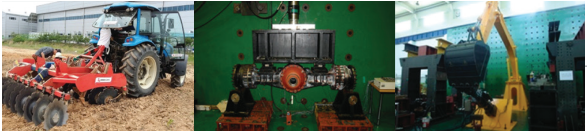
## TECHNOLOGY READINESS LEVEL [TRL]



## Excellence of Technology

(Railroad car)  
Railroad car bogie frame/car body structure

- Research objective: Fatigue test of bogie frame structure for railroad car
- Research content: Static load test, fatigue load test
- Fatigue test conditions (UIC615-4)
  - Stage 1: 100% (vertical load + lateral load + twist load) 6,000,000 cycles
  - Stage 2: 120% (vertical load + lateral load + twist load) 2,000,000 cycles
  - Stage 3: 140% (vertical load + lateral load + twist load) 2,000,000 cycles
- Measured data: Strain gauges, LVDT (over 80 chs)
- Crack inspection: Magnetic particle test (MT)
- Domestic/Exporting railroad car (KTX, Honam Line, maglev train, light rail)



(Construction machine/agricultural machine)  
Construction machine/agricultural machine structure

- Research objective: Durability test for wheel loader front/axle, agricultural machinery/harvesting machine structure
- Research content: Static load test, fatigue load test
- Fatigue test conditions
- Field test/working load analysis
- Durability condition, loading freq.



(Defense/aviation)  
Design and development test for Korean armored vehicle and aircraft

- Durability test of wheeled armored vehicle frame structure
- Design and development test for T-50 fuselage design and development test and Surion fuselage

## Current Intellectual Property Right Status

### PATENT

- A Load-testing Apparatus for a Train Bogie Frame (KR0896952)

### KNOW-HOW

- Design technology for test apparatus for 4-score suspending realizing vertical ground reaction force