ABW-3

AUTOMATIC BULK WEIGHING SYSTEMS

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WWMA

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Purpose:

To modernize the current ABWS code to include technology in use or available, while maintaining current safeguards in the code.

WHY?

- Some NTEP approved ABWS systems do not meet current specifications
  - This was not an error on NTEP's part, rather it was an effort to accommodate newer designs.
- Automatic bulk weighing systems are becoming more common
  - More efficient than traditional hopper scale systems
  - Potentially more accurate than a hopper scale system or AWS because of the use of "no load reference" weights.
- Current codes can make it difficult to distinguish between a hopper scale system, an ABWS, or an AWS.

ABWS History

- NCWM Interim January of 1982
  - Representatives of the Federal Grain Inspection Service (FGIS) express a desire for cooperation with the conference in developing uniform standards for the devices that fell within the jurisdiction of both FGIS and local and state weights & measures officials. They mentioned two specifically:
    - Automatic Electronic Bulk Weighing Systems (Grain)
    - Grain Test scales
- NCWM Interim January of 1983
  - S & T committee reviews a draft code for “Automatic Grain Bulk Weighing Systems”
  - They “decided that it (the draft code) had considerable merit, and that it could be applicable to ***not only grain but all automatic bulk weighing systems***.”
- NCWM Annual 1983
  - S & T committee presents the draft code and recommends it’s adoption as part of the new scale code.
  - It was adopted and added to the 1984 version of Handbook 44

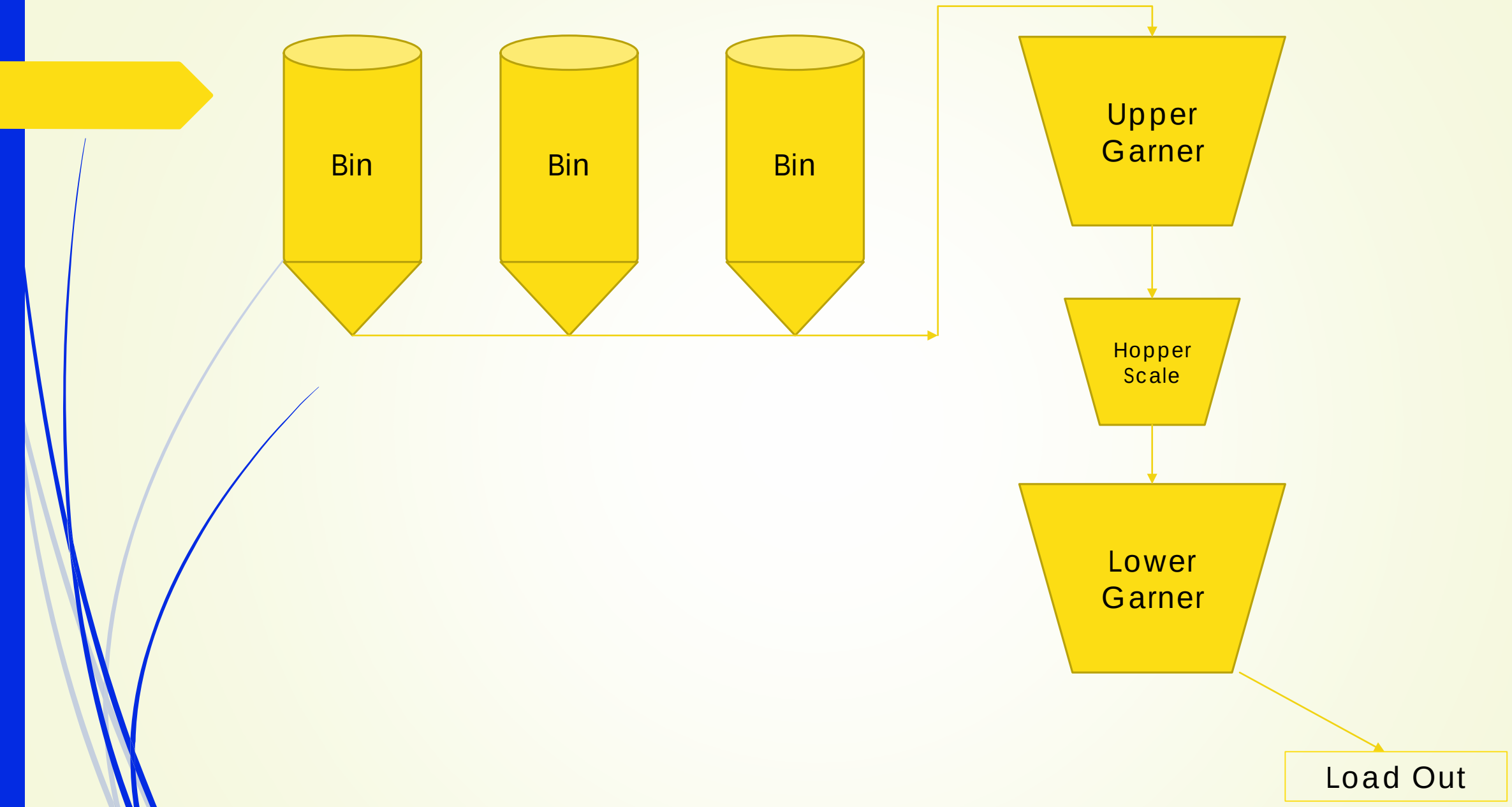
ABWS History

- NCWM Annual 1985
  - Proposal made to change code to include ***all*** ABWS.
  - Committee agrees but is concerned there isn't enough time address necessary changes.
  - The report specifically mentioned "systems used to weigh construction materials such as sand and gravel, or minerals such as coal and ore."
- NCWM Annual 1986
  - Again proposed that code be changed to include all ABWS.
  - Proposal adopted and the title was amended by removing the word "Grain".

No significant changes made since adoption

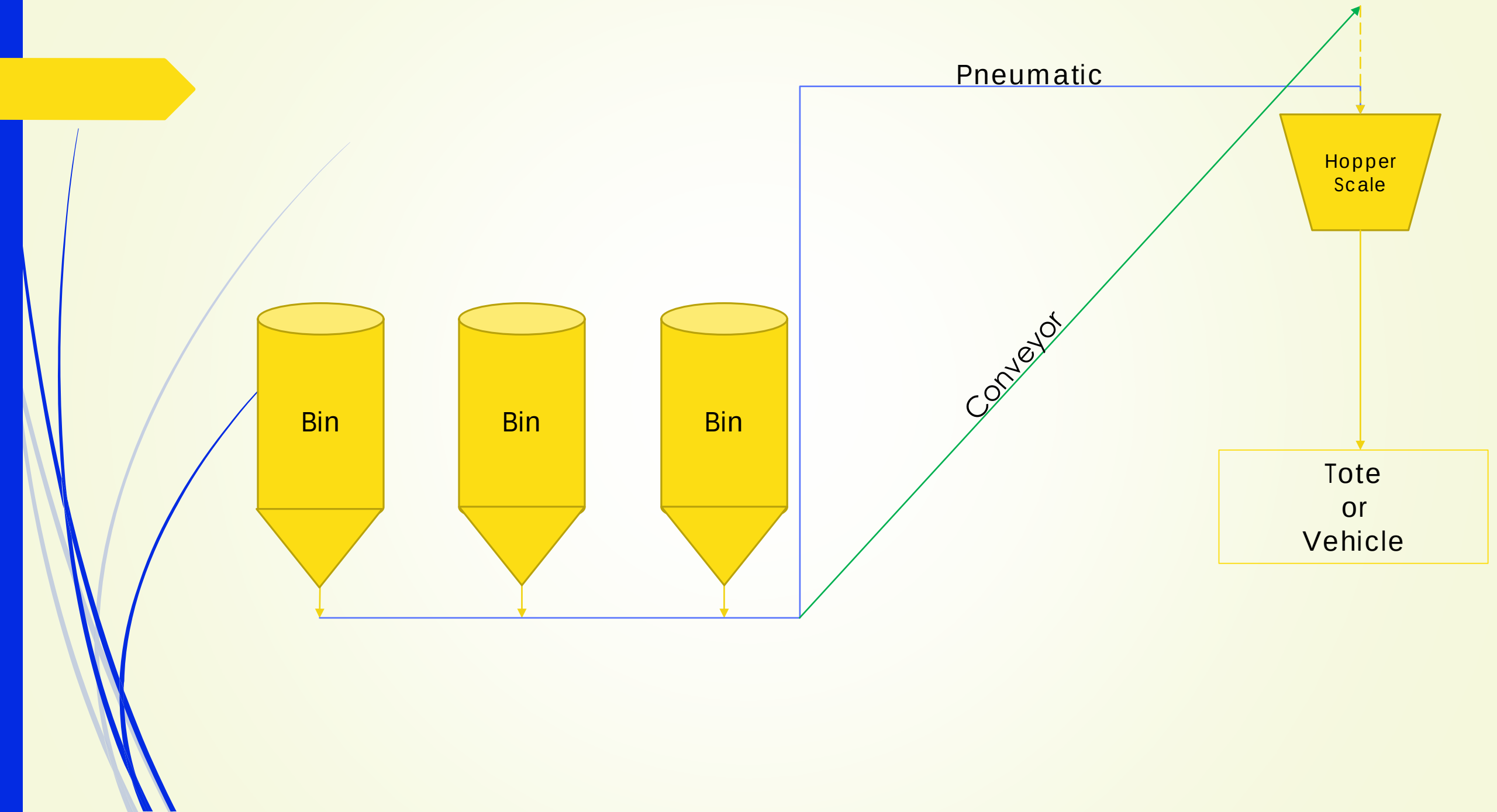
COMMON DESIGN OF TRADITIONAL SYSTEMS

- Vertical, gravity flow systems were common
  - Upper Garner
  - Weighing/Load Receiving Element (e.g. hopper)
  - Lower Garner
- Designed primarily for grain


Bin
Bin
Bin
Upper Garner
Hopper Scale
Lower Garner
Load Out

MODERN SYSTEM DESIGNS

- Horizontal flow systems common
  - Don’t rely on gravity, have other means for filling and removing weighed product
    - Augers, Conveyers, hoses, pipes, elevators, etc.
- Liquid systems in use
  - Tanks instead of hoppers
  - Product flow controlled with valves or pumps instead of gates
- Pneumatic Systems in use
  - Product Flow Controlled pneumatically throughout weighing process
- Seed Systems in use
  - Sometimes product flow controlled with conveyers in addition to gates
- Frequently don’t have permanent storage for weighed product
- Used for commodities other than grain including fish, seed, fertilizer, pesticide, etc.


Pneumatic
Hopper
Scale
Bin
Bin
Bin
Conveyor
Tote
or
Vehicle

Conveyor

Hopper Scale

HISTORICAL INTENT OF ABWS CODE

- To allow automated weighing of bulk materials
- To increase the efficiency of the weighing processes
- Establish requirements to minimize weighing errors.
  - Recognized returning to zero to determine net weight was
    - Time consuming
    - Mathematically unnecessary
    - Possibly even erroneous

KEY CHANGES

- Removes Automatic Bulk Weighing Systems from the definition of itself
- Clarifies what degree of automation is required to be considered an ABWS
- Designates when no load reference values must be recorded
- Designates the system shall indicate and record each weighment
- Designates the system shall calculate and record the associated net weight for each weighment
- Designates the system shall sum all net weights for a weighing process
- Allows operator to set limits for no load reference values
- Allows any conceivable product flow control design (gates not required)
- Replaces “Gate Control” language with “Product Flow Control” to eliminate design limitations.
- Replaces “weigh hopper” with “load receiving element” to eliminate design limitations. A weigh hopper is only one type of load receiving element.

Thank You

QUESTIONS?

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