Disasters - 2.0.0

The Disaster Event System is a dynamic feature designed to introduce unpredictable environmental challenges. At its core, the system can randomly trigger a distinct disaster each turn, forcing players to react to sudden and often dramatic changes on the game map. This ensures that no two games are alike and that even the best-laid plans can be challenged by the raw power of the world itself.

How Disasters are Triggered

The frequency and type of disasters are not just a simple random chance; they are deeply tied to the specific world you are fighting on. This system is governed by two key mechanics: the world's **Disaster Probability** and its unique **Disaster Pool**.

1. Disaster Probability (When Disasters Happen)

At the end of every turn (starting from turn 2 onwards), the game engine makes a simple "roll of the dice" to see if a disaster will occur. This is governed by a specific property in each world's profile called `disasterChance`.

How it Works: Each world is assigned a probability value, like `0.15` (15%) or `0.25` (25%). At the end of a turn, the game generates a random number between 0 and 1. If that number is less than the world's `disasterChance`, a new disaster sequence is initiated.

Design Impact: This makes your choice of world a major strategic consideration regarding risk.

- A world like **Grave-Star** has a low `disasterChance` of `10%`, making it a relatively stable and predictable battlefield where disasters are rare.
- In contrast, a chaotic planet like **War-World** or **Magma-Tor** has a much higher `disasterChance` (25%-30%), meaning you must constantly be prepared for catastrophic events that can shift the balance of power at any moment.

2. The Disaster Pool (What Disasters Can Happen)

When the probability check succeeds and a disaster is triggered, the game doesn't just pick one at random. Instead, it draws from a specific, curated list defined in the world's profile called `possibleDisasters`.

How it Works: Each world has an array of disaster keys that it is allowed to generate. The game randomly selects one disaster from that specific list.

Design Impact: This gives each world a distinct thematic and strategic flavor. It means players can anticipate *what kind* of threats to expect, even if they don't know *when* they will happen.

Summary: The Complete Flow

1. **End of Turn:** The turn's battles and orders are resolved.
2. **Probability Check:** The game checks `Math.random() < currentWorld.disasterChance`.
3. **Selection (if successful):** A random disaster is chosen from the `currentWorld.possibleDisasters` list.
4. **Targeting:** The system creates one or more **Disaster Sites** by selecting random cells of the appropriate type (`Area` or `Void`).
5. **Alert Phase:** A warning appears on the map, signaling the impending disaster for the next turn, giving players a single turn to react.

Anatomy of a Disaster

To simplify and unify the system, all disasters are now built from a shared set of flexible, reusable parameters.

UI Display

- **Name**: The thematic title of the disaster.
- **Icon**: A unique Material Symbol that visually represents the disaster.
- **Description**: A thematic summary of the disaster's nature and effect, intended for display in tooltips or briefing cards.

Core Game Logic

- **Disaster Site**: This is the fundamental concept of the new system. A disaster no longer targets an "Enclave" or an "Expanse," but originates from a single, specific `Area Cell` or `Void Cell`. This cell is the "Disaster Site" and the epicenter of all effects.
    - **Origin Cell Type**: Defines whether the disaster starts on a land cell (`Area`) or a water cell (`Void`). The system randomly picks a cell of this type to become the Disaster Site.
    - **Site Count**: Defines the number of simultaneous **Disaster Sites** the event creates when triggered. For most disasters, this will be 1.
- **Phases (Alert, Impact, Aftermath)**: Each phase of a disaster is a self-contained unit with its own properties.
    - **Name**: Thematic title of the phase.
    - **Description**: A short, thematic summary of the phase's effect.
    - **Duration**: How many turns the phase lasts.
    - **Radius (in cells)**: All effects for that phase emanate from the current Disaster Site in a circular radius. An entire entity (like an Enclave) is considered "affected" if any of its cells fall within this radius.
    - **Movement (in cells)**: Defines how many cells the Disaster Site moves each turn during this phase. The effect for a turn is always applied at the current location *before* the site moves to its new location for the next turn.
    - **Rules**: The specific mechanical effects that occur during this phase.

Visual Representation on the Map

- **Disaster Site Marker**: Each Disaster Site is represented on the map by a single icon corresponding to the disaster type. This marker is placed on the specific `Area` or `Void` cell that is the epicenter.
- **Independent Location**: This marker's location is independent of an Enclave's main marker. For example, if a disaster strikes a border cell of a large Enclave, the disaster icon will appear on that border cell, not in the center of the Enclave.

- **Dynamic Chip Integration**: In the specific case where the Disaster Site cell is the *exact same cell* as an Enclave's main marker, a separate disaster icon will **not** be shown. Instead, the disaster's icon and duration will be attached to the Enclave's main marker as a **dynamic chip**, keeping the UI clean.
- **Overlapping Disasters (Crisis Alert)**: If a new disaster is triggered on a cell that is already an active Disaster Site, the existing icon is replaced with a special **"Crisis Alert"** icon (`crisis_alert`). This new marker will then use its own dynamic chip to display the icons of all disasters currently active at that single location.

Disaster Profiles (Redesigned)

Entropy Wind

UI Display

- **Icon**: `tornado`
- **Name**: Entropy Wind
- **Description**: A howling gale of pure chaos moves across the land, unmaking everything in its path.
- **Assets**:
  - **Key**: `entropy-wind`
  - **Image**: `https://storage.googleapis.com/brutal-worlds/disaster/entropy-wind.jpg`
  - **SFX Alert**: `https://storage.googleapis.com/brutal-worlds/sfx/entropy-wind-alert.mp3`
  - **SFX Impact**: `https://storage.googleapis.com/brutal-worlds/sfx/entropy-wind-impact.mp3`
  - **SFX Aftermath**: `https://storage.googleapis.com/brutal-worlds/sfx/entropy-wind-aftermath.mp3`

    - **VFX Alert**: `https://storage.googleapis.com/brutal-worlds/vfx/entropy-wind-alert.webm`
    - **VFX Impact**: `https://storage.googleapis.com/brutal-worlds/vfx/entropy-wind-impact.webm`
    - **VFX Aftermath**: `https://storage.googleapis.com/brutal-worlds/vfx/entropy-wind-aftermath.webm`

Game Logic

- **Origin Cell Type**: `Area`
- **Site Count**: 1
- **Alert**:
    - **Name**: Chaotic Drafts
    - **Description**: Unstable air currents signal a tear in reality is forming.
    - **Duration**: 1 turn
    - **Radius**: 1 cell
    - **Movement**: 0 cells
- **Impact**:
    - **Name**: Entropy Lash
    - **Description**: The chaotic storm lashes out, unmaking matter at its epicenter.
    - **Duration**: 1 turn
    - **Radius**: 1 cell
    - **Movement**: 1-5 cells per turn (moves to a random adjacent, connected `Area Cell`)
    - **Rules**: Any Enclave occupying the Disaster Site loses 50% of its forces.
- **Aftermath**:
    - **Name**: Lingering Chaos
    - **Description**: The storm continues its path of destruction, weakening everything it touches.
    - **Duration**: 2-4 turns
    - **Radius**: 1 cell

    - **Movement**: 1-5 cells per turn (moves to a random adjacent, connected `Area Cell`)
    - **Rules**: Each turn, the affected location loses 25% of its forces. If it fails to find a valid `Area Cell` to move to, the effect dissipates.

Ion Tempest

UI Display

- **Icon**: `cyclone`
- **Name**: Ion Tempest
- **Description**: A storm of charged particles sweeps across the world, disrupting supply lines.
- **Assets**:
    - **Key**: `ion-tempest`
    - **Image**: `https://storage.googleapis.com/brutal-worlds/disaster/ion-tempest.jpg`
    - **SFX Alert**: `https://storage.googleapis.com/brutal-worlds/sfx/ion-tempest-alert.mp3`
    - **SFX Impact**: `https://storage.googleapis.com/brutal-worlds/sfx/ion-tempest-impact.mp3`
    - **SFX Aftermath**: `https://storage.googleapis.com/brutal-worlds/sfx/ion-tempest-aftermath.mp3`
    - **VFX Alert**: `https://storage.googleapis.com/brutal-worlds/vfx/ion-tempest-alert.webm`
    - **VFX Impact**: `https://storage.googleapis.com/brutal-worlds/vfx/ion-tempest-impact.webm`

    - **VFX Aftermath**: `https://storage.googleapis.com/brutal-worlds/vfx/ion-tempest-aftermath.webm`

Game Logic

- **Origin Cell Type**: `Area`
- **Site Count**: 1
- **Alert**:
    - **Name**: Static Buildup
    - **Description**: The atmosphere crackles with energy, signaling a massive electromagnetic storm is forming.
    - **Duration**: 1 turn
    - **Radius**: 2-10 cells
    - **Movement**: 0 cells
- **Impact**:
    - **Name**: EMP Burst
    - **Description**: An electromagnetic pulse disables critical infrastructure in the area.
    - **Duration**: 1 turn
    - **Radius**: 2-10 cells
    - **Movement**: 0 cells
    - **Rules**: A random route connected to any affected Enclave is disabled for 2 turns.
- **Aftermath**:
    - **Name**: System Malfunctions
    - **Description**: The lingering storm causes widespread system failures and disrupts offensive capabilities.
    - **Duration**: 2-3 turns
    - **Radius**: 2-10 cells
    - **Movement**: 0 cells
    - **Rules**: The attack effectiveness of any affected Enclave is reduced by 25%. Each turn, there's a 25% chance for another random connected route to be disabled.

Pyroclasm

UI Display

- **Icon**: `volcano`
- **Name**: Pyroclasm
- **Description**: A superheated cloud of ash and rock erupts, incinerating everything in its path.
- **Assets**:
    - **Key**: `pyroclasm`
    - **Image**: `https://storage.googleapis.com/brutal-worlds/disaster/pyroclasm.jpg`
    - **SFX Alert**: `https://storage.googleapis.com/brutal-worlds/sfx/pyroclasm-alert.mp3`
    - **SFX Impact**: `https://storage.googleapis.com/brutal-worlds/sfx/pyroclasm-impact.mp3`
    - **SFX Aftermath**: `https://storage.googleapis.com/brutal-worlds/sfx/pyroclasm-aftermath.mp3`
    - **VFX Alert**: `https://storage.googleapis.com/brutal-worlds/vfx/pyroclasm-alert.webm`
    - **VFX Impact**: `https://storage.googleapis.com/brutal-worlds/vfx/pyroclasm-impact.webm`
    - **VFX Aftermath**: `https://storage.googleapis.com/brutal-worlds/vfx/pyroclasm-aftermath.webm`

Game Logic

- **Origin Cell Type**: `Area`
- **Site Count**: 1

- **Alert**:
    - **Name**: Volcanic Activity
    - **Description**: The ground trembles, signaling a cataclysmic eruption is imminent.
    - **Duration**: 1 turn
    - **Radius**: 6-10 cells
    - **Movement**: 0 cells
- **Impact**:
    - **Name**: Incineration Wave
    - **Description**: A superheated wave of ash and rock incinerates the immediate blast radius.
    - **Duration**: 1 turn
    - **Radius**: 3-5 cells
    - **Movement**: 0 cells
    - **Rules**: Enclaves in the radius lose 33% of their forces. Each route connected to an affected Enclave has a 50% chance of being permanently destroyed.
- **Aftermath**:
    - **Name**: Ashfall
    - **Description**: A thick shroud of ash settles over a wide area, choking all production.
    - **Duration**: 3-4 turns
    - **Radius**: 6-10 cells
    - **Movement**: 0 cells
    - **Rules**: Enclaves in the radius have their force production reduced by 75%.

Resonance Cascade

UI Display

- **Icon**: `earthquake`
- **Name**: Resonance Cascade
- **Description**: The planetary core resonates violently, causing the ground to liquefy and shatter.

- **Assets**:
  - **Key**: `resonance-cascade`
  - **Image**: `https://storage.googleapis.com/brutal-worlds/disaster/resonance-cascade.jpg`
  - **SFX Alert**: `https://storage.googleapis.com/brutal-worlds/sfx/resonance-cascade-alert.mp3`
  - **SFX Impact**: `https://storage.googleapis.com/brutal-worlds/sfx/resonance-cascade-impact.mp3`
  - **SFX Aftermath**: `https://storage.googleapis.com/brutal-worlds/sfx/resonance-cascade-aftermath.mp3`
  - **VFX Alert**: `https://storage.googleapis.com/brutal-worlds/vfx/resonance-cascade-alert.webm`
  - **VFX Impact**: `https://storage.googleapis.com/brutal-worlds/vfx/resonance-cascade-impact.webm`
  - **VFX Aftermath**: `https://storage.googleapis.com/brutal-worlds/vfx/resonance-cascade-aftermath.webm`

Game Logic

- **Origin Cell Type**: `Area`
- **Site Count**: 1
- **Alert**:
  - **Name**: Seismic Tremors
  - **Description**: The ground begins to shake as the planetary core resonates with violent energy.
  - **Duration**: 1 turn
  - **Radius**: 1 cell
  - **Movement**: 0 cells

- **Impact**:
    - **Name**: Initial Shock
    - **Description**: The ground violently shatters, releasing a devastating shockwave.
    - **Duration**: 1 turn
    - **Radius**: Variable. 60% chance for 3 cells, 30% for 6 cells, and 10% for 9 cells.
    - **Movement**: 0 cells
    - **Rules**: Forces in affected Enclaves are immediately reduced by 25%.
- **Aftermath**:
    - **Name**: Seismic Instability
    - **Description**: The area is left unstable, crippling production and combat effectiveness.
    - **Duration**: 3-4 turns
    - **Radius**: Same as Impact radius.
    - **Movement**: 0 cells
    - **Rules**: Force production and combat effectiveness of all forces in affected Enclaves are reduced by 50%.

Skyfall Shards

UI Display

- **Icon**: `motion_blur`
- **Name**: Skyfall Shards
- **Description**: Crystalline fragments rain down from orbit, impacting multiple locations at once.
- **Assets**:
    - **Key**: `skyfall-shards`
    - **Image**: `https://storage.googleapis.com/brutal-worlds/disaster/skyfall-shards.jpg`
    - **SFX Alert**: `https://storage.googleapis.com/brutal-worlds/sfx/skyfall-shards-alert.mp3`

    - **SFX Impact**: `https://storage.googleapis.com/brutal-worlds/sfx/skyfall-shards-impact.mp3`
    - **SFX Aftermath**: `https://storage.googleapis.com/brutal-worlds/sfx/skyfall-shards-aftermath.mp3`
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    - **VFX Impact**: `https://storage.googleapis.com/brutal-worlds/vfx/skyfall-shards-impact.webm`
    - **VFX Aftermath**: `https://storage.googleapis.com/brutal-worlds/vfx/skyfall-shards-aftermath.webm`

Game Logic

- **Origin Cell Type**: `Area` or `Void`
- **Site Count**: 2-4
- **Alert**:
    - **Name**: Orbital Debris Warning
    - **Description**: Debris signatures are detected, signaling imminent kinetic strikes on multiple locations.
    - **Duration**: 1 turn
    - **Radius**: 1 cell per site
    - **Movement**: 0 cells
- **Impact**:
    - **Name**: Shard Impact
    - **Description**: Shards of orbital debris bombard the surface.
    - **Duration**: 1 turn
    - **Radius**: 1 cell per site
    - **Movement**: 0 cells
    - **Rules**: Any Enclave occupying a Disaster Site loses a flat 5 to 20 forces.
- **Aftermath**:

    - **Name**: Radiation Sickness
    - **Description**: Lingering radiation causes forces to slowly deteriorate.
    - **Duration**: 2-3 turns
    - **Radius**: 1 cell per site
    - **Movement**: 0 cells
    - **Rules**: Each affected Enclave has a 50% chance to be affected. It will lose 1 force at the end of each turn for the duration.

Void Surge

UI Display

- **Icon**: `tsunami`
- **Name**: Void Surge
- **Description**: A tear in reality unleashes a scouring wave of void energy.
- **Assets**:
    - **Key**: `void-surge`
    - **Image**: `https://storage.googleapis.com/brutal-worlds/disaster/void-surge.jpg`
    - **SFX Alert**: `https://storage.googleapis.com/brutal-worlds/sfx/void-surge-alert.mp3`
    - **SFX Impact**: `https://storage.googleapis.com/brutal-worlds/sfx/void-surge-impact.mp3`
    - **SFX Aftermath**: `https://storage.googleapis.com/brutal-worlds/sfx/void-surge-aftermath.mp3`
    - **VFX Alert**: `https://storage.googleapis.com/brutal-worlds/vfx/void-surge-alert.webm`
    - **VFX Impact**: `https://storage.googleapis.com/brutal-worlds/vfx/void-surge-impact.webm`

    - **VFX Aftermath**: `https://storage.googleapis.com/brutal-worlds/vfx/void-surge-aftermath.webm`

Game Logic

- **Origin Cell Type**: `Void`
- **Site Count**: 1
- **Alert**:
    - **Name**: Rift Instability
    - **Description**: The fabric of the void begins to thin, heralding an imminent tear in reality.
    - **Duration**: 1 turn
    - **Radius**: 3 cells
    - **Movement**: 0 cells
- **Impact**:
    - **Name**: Void Lash
    - **Description**: A wave of raw void energy scours the area, eroding all it touches.
    - **Duration**: 1 turn
    - **Radius**: 3 cells
    - **Movement**: 0 cells
    - **Rules**: Affected Enclaves immediately lose 50% of their forces.
- **Aftermath**:
    - **Name**: Void Contamination
    - **Description**: The area is left dangerously contaminated, cutting it off from the outside world.
    - **Duration**: 2-3 turns
    - **Radius**: 3 cells
    - **Movement**: 0 cells
    - **Rules**: All routes connected to affected Enclaves are disabled for the duration.

The Disaster Inspector

In-Game Description

"When your long-range sensors detect a catastrophic anomaly, you can dispatch a probe to investigate the site. The inspector view is the probe's telemetry, giving you a focused, real-time analysis of the impending threat and its projected timeline." It is your direct window into an active, unfolding catastrophe.

Design Rationale

This inspector is designed to be a simple, highly contextual, and immediate source of information. It only appears for an **active** disaster alert that is currently on the map. Its purpose is to answer three critical questions for the player instantly:

- **What is happening?** (The disaster's name and type).
- **What is the current status?** (The name of the current alert phase).
- **How long do I have to react?** (The remaining duration in turns).

By using the established Card and ChipCard UI patterns, it provides this crucial data in a familiar and easily digestible format without cluttering the main screen. The ability to hover for a full briefing provides an optional layer of depth for players who want to understand the exact mechanics of the impending impact.

Mechanical Breakdown

- **Activation**: The Disaster Inspector appears when a player clicks on an `ActiveDisasterMarker` icon on the 3D world map.
- **Header**:
    - **Icon**: The icon of the disaster, or in the case of multiple, a generic `crisis_alert` icon, colored amber to signify a warning.
    - **Title**: Statically set to "Disaster Site" to clearly label the context.
- **Content Section ("Effects")**:
    - This section contains a single ChipCard that represents the active phase of the disaster.
    - **ChipCard Breakdown**:
        - **Icon**: Displays the specific icon for that disaster (e.g., `cyclone` for Ion Tempest), colored amber.

        - **Title**: Displays the `name` of the current phase from the disaster's profile (e.g., "Rift Instability", "Seismic Tremors").
        - **Subtitle**: Displays the main `name` of the disaster (e.g., "Void Surge").
        - **Value Display**: Shows the remaining `duration` from the active disaster object, formatted as a duration (e.g., "1" with an hourglass icon), indicating how many turns are left in the current phase.
- **Interaction**:
    - Hovering over the ChipCard triggers the BriefingCard. This displays the detailed `description` text for the disaster's current phase, giving the player a full tactical summary.